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FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

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THE HOMEBREWED FRAME

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Palm Bay FL 32907-4116
<via compuserve 75006,702 / 29878NJ1T-EIES>

TNC FOR 820- Soon to be released - FADCA FADpad (Frame Assembler-Disassembler + Packet A-D) software for the Xerox 820 and TAPR FAD daughter board. FADpad represents the harvest of hundreds of hours of software development in the quest for a TNC that attempts to emulate the quality approach that Harold Price, NK6K, and his accomplices over at TAPR have established, in the environment of a Z-80 and within the constraints of the EPROMable space of the Xerox board (8K).

FADpad features a command set modelled upon Harold's work almost exclusively, and the fine user interface of the kit. TAPR earns a place in the hearts of the masses for their recognition that most users are not automated, and they're not running any higher levels beyond the link layer with their TNC. But they do it without ruling out the other layers on top of the TAPR tnc, through the use of an easy to remember english language command set. I believe this has done much to encourage Tom and Tina Packetboard to get on the air for something beyond just the "newness" of the mode.

Back to FADpad. The code supports AX.25 level 2, version 2.0 (1984) full duplex, as well as connections with version < 2.0 AX.25 TAPRs and GLBs. Selection between versions of AX.25 L2 is accomplished without user intervention. The user can select between hardware or software flow control, which are provided to the user's asynchronous port, the 820's ``printer port''. This async port is fixed at 4800 baud in the current version.

Although Ted K4NTA has had an early working version of FADpad for some time, there is still much testing to do before the software is made available for all. In March at the latest, I hope to have set up a way to distribute and support the code. In the meantime, please be patient.

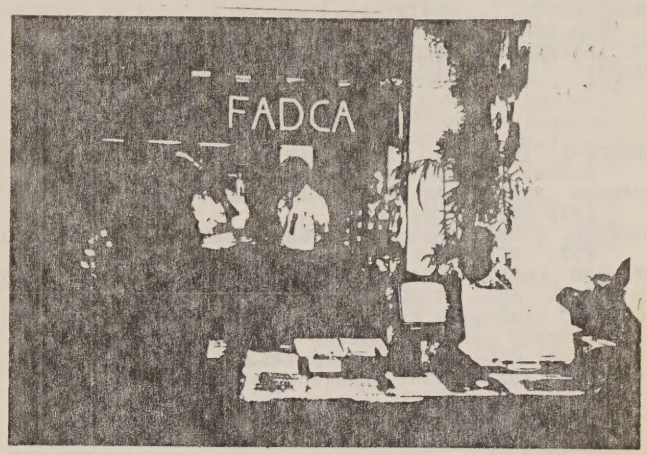
FAD PC BOARDS AVAILABLE- If you have an interest in the 820 board on packet, you'll want to take note that TAPR has starting selling the Frame Assembler-Disassembler daughter board. This should be a blessing to those of you who've followed the progress of the 820-on-packet in this column and want to do something to put your own 820 on without doing a lot of wire wrapping from a previous Homebrewed Frame article. The remote-control repeater, the GATOR 1 switching system - "real soon now" - and of course FADpad all are set up to run on the 820+FAD combination.

Contact TAPR's office for more information on product.

The Residue Latch
Rumination World

There's been a lot of talk and questions raised about the FCC rules as they relate to packet. Other "BEACON" authors have touched on this topic before as well. Rather than attempt to interpret the rules, I'm going to list some applicable sections from part 97 and leave it up to you on how you are going to comply. This may be a good approach as most enforcement questions in the gray areas will be decided by your local FCC Engineer and possibly the local TVI committee. Many of these rules are applicable to day-to-day operations as well as packet.

ID-97.84 - Station identification: (a) required times to identify, (c) automatic control, (g(3)) allows ID in any format provided for in 97.69(b).



The FADCA display at the Clearwater hamfest, Nov 25, 1984

Photo by K4RHD

97.69 - Digital communications: (b) defines Baudot, ASCII, and AMTOR as codes that one may legally ID with..(b) also defers to (c) on frequencies above 50 MHz, (c) permits operation with any digital codes subject to logging and bandwith restrictions of (c(1,2)).

QRM-97.69 (c(2)) defines allowable bandwith and sampling parameters for digital communications, 97.73 defines puts forth spurious radiation standards and the requirement that one must eliminate harmful interference of this kind "in accordance with good engineering practice"

REPEATER- 97.79 - Control operator requirements - 97.85 - Repeater operation and 97.88 - Operation of a station by remote control (if applicable). {A petition to modify the rules for unattended packet stations is now pending at the FCC.}

BROWARD EFFECT - Good hamfest, lots of cheap 8" diskettes (blank) at bargain prices (can one ever get enough?) There was a beautiful terminal program for the Macintosh talking to a TAPR kit at K4GFG's booth. Split screen and windowing (unfortunately, all I had the chance to see in a quick glance) were crisp and sharp - the effect of the high resolution display and customized program were powerful..even more so to me as I had just logged about a half an hour on a lap computer with an ugly, difficult to read display. This has to be a "Gotta Have" item if you've already own a Mac or Macalike. The result is an impressive demo system for non-packeteers and nihilists alike. Jack WA4FIB is the author of the program. I'm not sure of its availability though. [Jack has promised an article on his 'Macpacket' program very soon. -ed.]

STILL HERE - But it is hard to tell. Things have been rather busy out here both with school and FADpad work. Thanks everyone for your support, especially Gwyn whose been exceedingly patient with me and understanding of the absence of material. Anyone who's tried to reach me and failed, please try again now! A short note or electronic message is preferable to a telephone QSO for the scribbled notes I've taken from phone calls seem to lose their context by the time they get acted on.

FADCA sponsors the SOUTHNET packet network.

WIDE-AREA DIGIPEATERS

JACKSONVILLE:	WB4RCY-1
GAINESVILLE:	KF4TT-1
OCALA:	K4OZS
ORLANDO:	K4AHO-6(operational testing), N4JWX
MELBOURNE:	N2WX-7
TAMPA:	W1BEL, W9DVM
CLEARWATER:	KC2FF-7
STUART:	K4NTA-1
OKEECHOBEE:	WA4IYY-1
W. PALM BEACH:	WA4ARE-1
FT. LAUDERDALE:	W4LDP-1, WA1JOU
MIAMI:	W4NVU

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 0800 EST. NCS: K4NTA

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 1930 EST. NCS: KF4EF

BREVARD COUNTY AREA: 147.060 (+600) Sunday at 2000 EST. NCS: N2WX

BROWARD COUNTY AREA: 145.270 (-600) Sunday at 2000 EST. NCS: K4GFG

SOUTHNET statewide frequencies:
Primary LAN and calling frequency:145.010
Local QSOs & file xfers:145.030 /050 /070 /090
220 LANs (20 KHz bandwidth): 221.720, 221.780
Narrow bandwidth linking (20 KHz b/w): 221.400
Medium bandwidth linking (100 KHz b/w):220.570

SOUTHNET ELECTRONIC MAIL SERVICES

BULLETIN BOARD SYSTEMS

STUART (EAST CENTRAL FLORIDA): K4NTA
WEST PALM BEACH: WD4LHF
MIAMI: NK4K

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM, N5AUV, K4GFG
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL
HF and OSCAR-10: Real soon now...

Florida stations known to packet 01/15/85 update

K3AAX	DAVE	MELBOURNE
W4ABV	BILL	APOLLO BCH
KA6ADB	MARTIN	BOYNTON BCH
K4AHO	JIM	ORLANDO
N4AIY	STEVE	BRANDON
N4AJH	JERRY	SATELLITE BCH
N4APC	BOB	SEBRING
W4APV	JIM	ST PETERSBURG
WA4ARE	DGPTR	<-1D>W PALM BCH
N5AUV	GEORGE	PALM BAY
KB4B	JACK	JACKSONVILLE
N4BE	JIM	MELBOURNE
W1BEL	GWYN	BRANDON
WD4BIW	BOB	JACKSONVILLE
WD4BMN	LARRY	ALTAMONTE SPGS
WD4BRF	GEORGE	STUART
K4CAG	CARLOS	HOMESTEAD
K4CAJ	CECIL	W PALM BCH
WB2CPV	BILL	GAINESVILLE
K1CYG	STANLEY	ORLANDO
WB1CYM	SEL	PT CHARLOTTE
KC4DE	LEO	MIAMI
W4DFU	UNIV FL	GAINESVILLE
WA2DLI	GARY	W PALM BCH
N4DNW	BILL	PALM BAY
W4DPH	JIM	CLEARWATER
N4DST	JERRY	ST PETERSBURG
W9DVM	PHIL	TAMPA
WD0EEL	JIM	BOCA RATON
KF4EF	PAT	TAMPA
WB4EHG	DICK	PEMBROKE PINES
KA4EPS	LU	LAKE WORTH
KB4ES	PAUL	NORTH MIAMI
WB4EXN	TONY	OCALA
KC2FF	ANDY	CLEARWATER
WA4FIB	JACK	INDIAN ROCKS BCH
N4GEB	BOB	MELBOURNE
K4GFG	TOM	DAVIE
WA4GIF	BUTCH	ORLANDO
K4HFL	ART	NEW PORT RICHEY
WD4HIM	BRUCE	ORLANDO
KB4HJM	LEO	FT PIERCE
WB4HPD	KEN	TAMPA
N4HWW	DAVE	MADEIRA BCH
WA4HXZ	HENRY	W PALM BCH
KF4I	LARRY	JENSEN BCH
VE3ILW	LYMAN	TAMPA
KF4IO	PAUL	TAMPA
N4IPX	STUART	ORLANDO
KB4IU	JACK	SATELLITE BCH
WD4IXD	AES DEMO	ORLANDO
WD4IXI	BILL	ST PETERSBURG
WA4IYY	CHARLIE	OKEECHOBEE
WB4JCM	BOB	GAINESVILLE
WD4JKM	BILL	MIAMI
WA1JOU	RON	FT LAUDERDALE
N4JWX	DAVID	<-0D-1D>ORLANDO |
NK4K	BILL	MIAMI
WD4KAV	JOE	STUART
N4KBA	PHIL	PLANTATION
W2KGV	LADD	PT ST LUCIE
WB4KGY	DOUG	W PALM BCH
N4KPU	HOWARD	WIMAUMA
NX4L	STEVE	MIAMI
KF4LG	BILL	BRANDON
WB3LGB	JOE	ST PETERSBURG
WD4LHF	JAMES	<B>W PALM BCH
KA4LIF	THOM	STUART
KB4LLO	DON	BRADENTON
WA4LLU	GLENN	TAMPA
VE3LU	CLAYT	KISSIMMEE
WD4MBL	RENE	MIAMI
KE6MN	DON	ORLANDO
AC7N	PASCAL	MELBOURNE
WB4NCH	ANDA	TAMPA
KE4NL	BILL	SARASOTA
KA4NOF	PHIL	W PALM BCH
K4NTA	TED	<-0B-1D>STUART
W4NVU	DADE EOC	<D>MIAMI
WA4NWO	JOE	POMPANO BCH
WB4OAR	MARTY	ORLANDO
K4OQ	BOB	CLEARWATER
W4ORA	JIM	TAMPA
K4OZS	LARRY	OCALA
W4PCM	DICK	JACKSONVILLE
W4PHL	PB EOC	W PALM BCH
KE4PM	LARRY	AVON PARK
WD4PQN	AL	OCALA
WA3QFN	NEIL	SAFETY HARBOR
W0RAO	ED	CASSELBERRY
WA5RCX	RED	FT PIERCE
WB4RCY	DGPTR	<-1D>ORANGE PARK
K4RHD	BILL	SEMINOLE
KK4S	RAY	SARASOTA
NJ4S	FRANK	MIAMI
WD4SFG	JOHN	MIAMI
W4SZ	JOHN	CLEARWATER
KI4T	JOEL	MIAMI
K6TCS	FRANK	LARGO
WB4TRJ	ART	ORLANDO
KF4TT	SCOTT	GAINESVILLE
W4UZJ	LLOYD	RIVIERA BCH
KE4VR	BOB	LAKE PARK
KA4VWW	GUY	STUART
KF4WM	JACK	WINTER PARK
KA4WNZ	ART	TAMPA
KC4WV	DAN	SEMINOLE
N2WX	HOWIE	<-1-2-7D>PALM BAY
WB8ZPE	BRAD	BRANDON
N4ZQ	KEITH	SEFFNER
K4ZS	FRED	TITUSVILLE
KB4ZS	BILL	SEFFNER
WB4ZXS	JOHN	COCOA

key- <{-n}{B}{D}> where
n = SSID, B = Bulletin Board avail
D = Wide coverage digipeater
* means station not known to have packet capability

K4GFG-1>BEACON:*** FT. LAUDERDALE DIGIPEATER SIGNS ON AT NOON TODAY! *** LOOK FOR W4LDP-1

The frequency coordinating body for Northern California, NARC, today officially coordinated the following frequencies for Packet Radio use:
145.01, 145.03, 145.05, 145.07, 145.09 MHz in the Two Meter Band.
223.56, 223.58, 223.60 MHz in the 1-1/4 M Band.
441.000 MHz in the 70 cm Band.

LETTERS

Sycamore, GA
Jan 5th, Sat nite

Hello Gwyn,

Well the second "S. A. P. S." meeting is now history. We had a very good showing of interested newcomers as well as our small packet group. There were some from Thomasville, Albany, and Atlanta, along with WD4LYV, KF4JF, WB4ZNW, KA4DPF, WD4MNT, and K4XA of the SAPS group. KD4NC and N4CLA were also at the SAPS meeting. We had a good meeting and are anxious to begin some testing and establishing some digipeaters as soon as possible.

We discussed sites for digipeaters, equipment on hand and what we would need for the first two high site links. The sites are near Dawson, Pelham, and Waycross, GA. The Dawson and Waycross sites will come on first and will link Atlanta to Jacksonville. They are just a matter of the time to get a couple of 820 boards together as digipeaters. We are a small group so getting these two and later the third one on will take time unless there is someone who can help out. We need power supplies, modems, and FAD boards to get going. We are receiving help already from several packeteers.

I'm interested in info on what 220 MHz gear is being used for link testing. I heard Hamtronics mentioned on the 75m net. Provided the cost of a transceiver isn't out of sight, I would work towards getting a couple for testing here. The Atlanta group is planning on some 400 MHz testing, but I feel the long link between sites will be much more solid on 220 MHz. Gwyn, as funds are available here, I want to become involved with tests in linking. I'm on the lookout for some 220 MHz gear. See ya on the net.

73,
Wayne Harrell, WD4LYV

Good to hear from you, Wayne. Somewhere along the line I missed out on what SAPS stands for. (South of Atlanta Packet Society?) We are very pleased to hear of your enthusiasm and progress. You are in a key location for linking all of the Florida activity with populous areas to the North. FADCA will be able to provide some 820 related gear for experimental use and I solicit FADCA members to continue assisting your group is adding this extension to SOUTHNET. It is only fair and reasonable for the LANS in densely populated areas to bear part of the burden of establishing links through the countryside. Please send a more detailed plan of your proposed 144 MHz digipeater installations and your ideas for becoming involved in 220 linking. Include a listing of the equipment you have available and on order, and describe in detail what else is needed. Together we'll make it happen.

After I read the February issue of COMPUTE and entered the terminal program published in it, I came to the conclusion it will do all that is required for packet operation and would recommend it over my terminal program, by far (see Classified Ad in last month's BEACON). I can make it available to anyone who has bought the February COMPUTE, to keep them from having to type it in. This program runs at from 50 to 2400 baud, selectable parity, word length, stop bits, full/half duplex, and user definable keys. Also supports custom translation of individual ASCII charecters, input or output. Seems to do everything!

TNX and CUL Bob , WD4BIW

KF4WM>BEACON:orlando...mailbox open

K4NTA>FADCA:de K4NTA/R via K4NTA-1/R Stuart 01/19/85 08:00
Stuart BBS Contains Undelivered Messages for :
ALL - K4GFG - K4ZS - KF4EF - N2WX - VE3LU - WD4BIW - WD4BRF - WD4KAV -

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Bernie N4FOC, a former packeteer from West Palm Beach, is now on the air in Chicago with his new call KD9KU. Look for Bernie on HF in the future.

Reply to:
1829 N.W. Pinetree Way
Stuart, Florida 33494
December 24, 1984

Mr. Tom King, WB4ILH
Florida Repeater Council
P.O. Box 4155
West Palm Beach, Fl
33402-4155

Dear Tom,

When I last wrote you in July, there were about 50 hams on packet radio in Florida. That number has now grown to over 100. In addition to the digipeaters that were operational at that time in Stuart, Miami and West Palm Beach, there are now new ones in Okeechobee, Jacksonville and Melbourne. There are also home stations in Brandon, Clearwater, Orlando, Ft. Lauderdale, Ocala and Gainsville (U of F) that serve as digipeaters for these areas.

The high speed network to relay between the various digipeater cities is in the testing stages now. The first expiremental link will be in Tampa and Melbourne on 220 Mhz.

Most of the packet operation in Florida has been on 145.010. This is also the frequency used by most areas of the country. As the high speed linking stations come on line and as the the number of packets radio users continues to grow, a single frequency is not enough. We therefore ask at this time for cordination of additional two meter frequencies for packet radio in Florida. We would like to use 145.010, 145.030, 145.050, 145.070 and 145.090. These freqencies would be assigned to areas by FADCA as the channel loading increased and for special purpose stations such as bulletin boards and for file transfers. As the high speed linking stations come on line, these frequencies would be assigned to cities as the input to the high speed network on a coordinated basis by FADCA based on the coverage area.

If you have any questions, please contact me at the above address or by phone at 692-0728 (home) or 842-5261 (work).

73, Ted Huf, K4NTA

ATTENTION GLB DIGIPEATER USERS

If you are using a GLB PK-1 primarily as a digipeater, you should immediately get a software update from GLB. Software prior to Version 3.5 will not digipeat multiple frames with multiple digipeaters. If a GLB PK-1 is specified as part of a multirepeater path, only the first frame in any transmission will be repeated. This can exponentially increase the traffic on a channel where a PK-1 is a wide-coverage digipeater.

To get your software updated to Version 3.5, send a $10 deposit (or your current PROMs) to GLB. When you receive your new PROMs, send the old ones to GLB and you will get your deposit back.

This is an important problem, and should not be ignored by GLB users. The GLB address is

GLB Electronics
1952 Clinton St.
Buffalo, NY 14206.

From : K4NTA
Subj : Xerox 820

Please refer to the Nov/Dec FADCA>BEACON for intructions on changeing one of the 2716 EPROMS to a 2764. Here is how to change the other on as well. In the first mod to use a 2764 in socket U64 we moved A13 to A and grounded B & C on U62 (LS138). What this did was select *RECO (U64 *CE) if A13, A14 & A15 were all low, BANK was high and *MREQB was low. Now if all the conditions mentioned above are the same except A13 is high, *REC1 (U63 *CE) will go low to enable U63. With A13 high this makes the starting address of U63 2000H. If we want to use a 2764 in U63, just make the same socket changes that were done to U62. You could use a 2716 in U63 with no additional wiring changes. Bank switching will still work because a low on BANK switches out both EPROMS and permits *RAS0 to select the RAM bank from 0000H to 3FFFH. The *CRTCE for the video RAM will not work in any case.

NEWS AND VIEWS
Gwyn Reedy, W1BEL

Volume #2. Seems hard to believe what has happened in the past year in FADCA land. N4ZQ teases me to make some predictions for 1985 as I did a year ago. I must reveal my method: I combined what I hoped would occur and what was necessary to make a success of packet activity in the Southeast, and predicted it would occur during that first year. Then I worked hard all year to try to make them all happen. Many other dedicated folks did the same, and now we can reflect on the progress made in that year. So for 1985 I will not predict what "will happen," but rather set goals I feel we should try to reach. The following items are NOT in priority order.

LINKING: We must get operable links going between the major population centers. While many of the creative people in packetdom discuss (argue?) about the ideal protocol for level 3, we are making progress with RF and digital hardware to make use of that eventual protocol. By year's end we should strive to have GATOR-1 protocol links at 9600bps spanning the state and allowing the 145.01 digipeaters to concentrate on supporting their LANS by one hop digipeating.

FREQUENCIES: A plan must be developed for orderly transition to the multiple planned frequencies in the two meter digital simplex band (145.01/03/05/07/09.) Congestion on 145.01 already is a severe problem on busy nights. One suggestion is to move message servers (BBSs) to other frequencies, but that step taken alone will reduce their coverage. I think the Xerox 820 will come to our rescue again by allowing BBSs to be attached directly to linking nodes for distant users and other than 145.01 for local users. Another approach would be frequency agility for BBSs. Local users would contact the BBS on 145.01 and command it to move to a locally clear frequency. Upon completion of the session, the BBS would resume monitoring 145.01. Finally, an 820 digipeater could monitor several frequencies and provide a "heard log" on the 145.01 channel that indicates the callsigns of stations active on all the frequencies in its local area. That would make it possible to locate any local station by accessing 145.01. When extensive linking is in place, a number of local frequencies will be needed to feed the link. In time, all of the so-far allocated 2 meter frequencies may be LANs tied into the high speed link node and the location of all of the locals monitored by the link node controller. In the meantime we need somehow to keep from losing contact with anyone, for the ability to send a message to someone and have the confidence that it will be received is one of packet radio's greatest advantages.

TRAFFIC HANDLING: My definition of traffic includes the National Traffic System (NTS) and a lot more. Don't you usually think of traffic as unimportant or frivilous subject matter except in time of emergency? (I'll probably get a few letter-bombs on that one.) I listen to traffic nets on occasion and thats my assessment of what I hear. The NTS is a good system for getting the messages through, but most messages seem so 'artificial.' I believe that is an indication that most message senders (but not the NTS people) don't really take the system seriously. Now consider the messagegs on your local BBS, whether packet, RTTY/AMTOR MSO, telephone, or whatever mode of access. Sure there are some really flakey BBSs on the phone, but get into a good, serious RCPM machine sometime. Much of the 'business' of FADCA gets carried on via BBSs and other message servers. Now that is TRAFFIC I can respect. There doesn't have to be a differentiation between those methods of traffic handling. If there is a reliable, convenient, and speedy system to pass information, people will use it, and they will trust their time-sensitive, important information to be carried by it. In Florida we must get going with the software and procedures to support information handling. W0RLI is doing an excellent job of developing this type of system, and our task is to rapidly become involved in a multi-point extension of that system into our area.
I must acknowledge the pioneering work being done by N2WX and K4NTA in securing NTS accreditation for the Florida Packet Traffic Net (FPTN) as SOUTHNET is now known to the NTS.

ORGANIZATION: FADCA has grown very rapidly, as has the entire packet movement. We are making more and more contacts with our GRAPES and SAPS neighbors to the North, and the time has come to look into forming a regional confederation (Southeast USA) of packet groups to coordinate linking, frequency usage, procedural matters, and present a united front to other amateur and non-amateur groups. Note the news items in this issue about the Mid-Atlantic group, as well as the San Francisco based article on frequency management. Don't know how this one will work out, but I feel it is needed. Perhaps this will be the year that a national packet organization will spring up....TAPR didn't rise to the occasion last year, but perhaps their willingness to do what is needed will surface this year. I look for continued good things from the ARRL in the digital field, but do not think they will capture real leadership of the packet scene if a dedicated packet group steps forward.

EQUIPMENT AND SOFTWARE: This year there should be many adaptations of existing equipment and new designs should surface. The announcement of packet software for the 820 in this issue is just the start of a full year. FADCA will expand its efforts to support design experimentation and prototyping, and even production of widely needed items of software and hardware. We have people working on RF and digital hardware for data transmission, switching and control, and linking software. Many applications programmers are developing terminal software, and I expect some interesting and useful applications to be developed after the application oriented packet seminar at the Miami Hamvention.

PEOPLE: Packet radio started out with experimenters and while they are alive and well (and trying to win arguments about networking protocols and processor capacities that are spillovers from the commercial world) packet radio is well into the era of the user. Two goals for us here in Florida because of such growth. We need to actively recruit technical personnel into our ranks so that we may continue to be effective in contributing to the growth of amateur information handling capabilities and the establishment of a national packet network. Also we must support the packet 'users' we have recruited with grand visions of digital miracles. Packet must be interesting and useful to be successful.

OTHER: As much as meteor burst communication fascinates me, I must admit it will not play a significant role in packet communication. It has a useful role in long-haul work especially for unattended operation into sparsely populated areas, and will remain an area for research and experimentation. The rate of digipeater construction presages a similar willingness to construct and operate linking gear, and by year's end significant VHF/UHF links along the East Coast will have reduced the need to employ any low capacity modes of linking. HF packet will support those necessary links until the store and forward satellites are available. HF and OSCAR-10 packet work will depend on the implementation of better modulation schemes and the widespread availability of equipment. The Packet Adaptive Modem had better be widely distributed soon or it will become eligible for burial beside the AMRAD PAD (Packet Assembler/Disassembler), an excellent design that suffered production delays until it became outdated in the prototype state.

Such ramblings are fun, but enough is enough. Actually if some is good, then more is better, and too much is just right.

I have been working on a list of packet people in the Southeast region for several months. It was supposed to be in the December issue of the BEACON, and as a result of not being ready, the double NOV/DEC issue occurred. It is still not ready, but is very likely to be an insert in the February BEACON. It will contain in one list the names and addresses of all FADCA members, all packet stations in Florida and South Georgia, all persons that have expressed an interest in packet activity. The names will be referenced to fifteen arbitrary Local Area Nets as follows: So Georgia, Panhandle (rather a large LAN, HI), Tallahassie, Jacksonville, Gainesville/Ocala, Daytona Beach, Orlando, Tampa Bay, Melbourne, Sebring, Stuart, West Palm Beach, Fort Meyers, Fort Lauderdale, and Miami. In the meantime, N2WX's excellent packet station list is included for your reference.

Based on last month's editorial, N4AIY has volunteered to write a regular column on emergency communication and KB4LLO will write introductory pieces for newcomers. An early product will be a listing of acronyms and their meanings that will make the BEACON more readable. Stay tuned.

GULF COAST 220 MHZ LINK EXPERIMENTS

BILL HITE K4RHD

Packet radio on 1-1/3 Meters has definitely gotten off to a fine start for the New Year of 1985. There are now five active Gulf Coast packet stations on "our" [1] FADCA packet frequency of 221.4 MHz

Yours truly (K4RHD) is running a Midland 13-509 transceiver driving a surplus F.A.A. AM-6155/GR-22 amplifier providing 250 watts input to the feed system of a pair of stacked KLM 9-element beams vertically polarized and hard mounted at 40 feet (75' AMSL) pointed East. The use of low loss Belden 9913 coax reduces feed line losses to 1.6 db (measured), permitting 173 watts to be utilized by the beams resulting in about 2800 watts ERP. The receiver is preceded by a Lunar Electronic GaAs FET preamp.

Gwyn (W1BEL) recently up and running with a Midland 13-509 transceiver driving a surplus F.A.A. AM-6155/GRT-22 linear power amplifier [2] for an output of 250 watts feeding a vertical collinear presently at 65 feet. This will change to a big "boomer" beam at 80 feet at the conclusion of his new tower construction. The receiver is super-charged with a new GaAs FET pre-amp by Advanced Receiver Research. A very impressive setup for the linking work ahead.

Bob (K4OQ), on Clearwater Beach, just purchased an Icom 37A to drive an Isopole antenna at 50 feet. He is at a disadvantage living at sea level and has a 60 foot ridge staring him in the antenna from the East.

Ray (KK4S) in Sarasota was really the first one on 220 packet here on the Gulf Coast with an Icom 37A and an 11 element Cushcraft. His first problem was no one to packet to for a long while and now he discovered (or should I say his neighbor discovered) he has TVI. So for now, Ray has restricted his 220 operations to the monitor mode only. A cable TV truck installing distribution cable in his area the other day was a hopeful sight.

A major interest and goal of this operator in the months ahead will be to participate in the task of defining the requirements and developing the hardware necessary to implement a medium to high speed packet linking network. Obviously, the hardware development is only half of the task that confronts packet linking. An equally and probably more difficult task will be developing the linking software known as "level three protocol". However, the software I leave entirely to others and will concern myself only with the hardware aspect. Something I can saw, bend, file, fit, wire, solder (and stomp on when it doesn't work)!

First, lets consider some desirable features which should be incorporated into the planning and design of our linking network from the onset.

1. RELIABILITY - This one attribute alone will be the most difficult to achieve and maintain by the Amateur. Almost all other facets of the link will pivot on this subject at one time or another and can be realized only through careful planning, design and construction from the very start. Some of the factors affecting the reliability of the link will be propagation conditions, equipment integrity, operating environment, availability of emergency power sources, and the willingness of the Amateurs to maintain and support a network of continuous duty digipeating stations.

2. ACCESSIBILITY - Early in the hardware development stages, attention should be addressed not only the best possible design but also to designing around equipment and parts that will be accessible to the average Amateur builder. Exotic or very expensive components will not attract much enthusiasm among the Amateur ranks, and as a result little or no linking will go beyond the drawing board. Since we are working with a rather advanced communications technology, we should expect a few sophisticated components to be incorporated in some designs, but they should be selected on the basis that they will have a good chance of becoming widely used and hence, price and availability would soon be within reach of most Amateurs. Also, experimentors should be encouraged to work together and form group purchase agreements to take advantage of quantity price discounts. Perhaps a few who are not interested in design and construction projects could lend their expertise to the cause by coordinating and expediting group purchase orders. This would indeed provid very valuable service.

GETTING STARTED - Some may ask "what is needed to get started and where do we begin"? Speaking for the RF hardware aspects of packet linking, I know of very little activity on a state wide basis. Hopefully, a start in that direction has begun here on the West Coast in the last few months. Several stations in the Tampa Bay Area (TBA) have chosen the 220 MHz band for linking experiments. This band was selected for several reasons. First, the 220 MHz band is the only one available to the Amateurs where it is practical and legal to run high power (1000 watts) which is necessary if long linking distances are to be achieved utilizing troposcatter propagation techniques. Second, commercially manufactured equipment and parts for the 220 band are becoming more readily available and at a price the Amateurs can afford. A good example is the surplus F.A.A. AM-6155/GRT-22 power amplifier with a "ruggedized" 4CX250 final. When slightly modified, this little beauty will yield an easy 250 watts output with less than 10 watts of drive. Third, the latest 220 band take-over attempt by commercial interests has apparently failed to gain support from the F.C.C. (For detailed information, see January issues of Ham Radio, pg. 8 and QST, pg. 13). Now is the time to become active on this valuable and important piece of radio real estate. If we occupy and populate the 220 MHZ band in the next few years we will most likely hold on to it in the future. Lets face it, two-meters is just about full here in Florida and else where. What other logical choice do we have? We had better "use it or lose it".

PROPAGATION STUDY - One of the first questions to be answered is, how many linking stations will be required to provide reliable packet communications over a given distance? Some factors which need to be addressed are: propagation conditions in Florida, which are affected by terrain and weather conditions; effective radiated power (ERP) which is determined by power available to the antenna system and the overall antenna system gain including height; and the performance of the station receiver. In an effort to begin collecting some pragmatic data which might be useful in answering the question, I have built into my computer a real time clock with program selectable interrupts such that regular propagation beacons can be transmitted at precise time intervals. Each beacon will contain a fixed message and the current date/time stamp which is up-dated each time a packet is sent. The procedure is to packet in the UNPROTO mode to a distant station listed in the VIA field of the UNPROTO command. The beacon station (K4RHD) will set the MONITOR mode ON, MFROM set to K4RHD, and MTO set to NONE. A link path will exist when the original transmitted beacon is received by the distant station, digipeated, and received back by the originating station where it will be stored. To reduce the raw data, I have written a program to tabulate the number of received digipeated beacons for each of the 24 hours in each day of testing. When sufficient daily data has been collected another program will calculate the percentage of successful two-way packets for each hour of the day during a given month and the results can be printed out in tabular form and perhaps printed in the FADCA BEACON. Some data has been collected in cooperation with W1BEL-2 and a few interesting characteristics have emerged. However, 34 miles is not very representative of troposcatter. We must await more station's arrival on the band interested in pursuing this kind of work. If anyone wishes to participate, please let us know. Until the next article, I'll be beaconing on 221.4 MHz, 1600 to 2200 daily, or more. Listen for us and report what activity you hear. 73.

FOOTNOTES:

[1] I say "our" FADCA frequency only to the extent that the Florida Repeater Council (FRC) has assigned 221.40 +/- .01 MHz for narrowband packet and 221.57 +/- .05 MHz for wideband, high speed packet linking. The assignment of these frequencies by the FRC was through the work of Jim (W4APV). This was a very wise move, because in recent disputes over frequency usage, the F.C.C. has ruled in favor of the parties whom were allocated that frequency by their state's repeater council.

[2] Purchased through Fair Radio Sales Co.; P.O. Box 1105 E. Eureka St.; Lima, Ohio 45802; Phone 416/223-2196; Price - $149.50 plus shipping.

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA
1829 N.W. Pinetree Way
Stuart, Florida 33494

It was good to hear from an old buddy from back in the early days of FM and repeaters in this area. It was Don KE6MN, his old call was WA4YIH from Ft. Pierce. Don was tring out his new AEA TNC before going back to Munich, Germany where his call is DJ0HC. Don says that there is quite a bit of packet activity across the pond and will be putting up a OSCAR-10 station when he gets back to Munich.

I would like to extend a big welcome to packet radio to KB4HJM, George in Ft. Pierce. George is the EC of St. Lucie County and if working packet radio into his emergency plans.

The West Palm each digipeater, WA4ARE-1 is at a new higher site now. It is too soon for to tell just how much better it is, but it does have greater range.

WA4IYY-1 the Okeechobee digipeater is at Charlie's house right waiting repairs to the radio and for a new antenna on the 300' tower where is usually is located.

Lu, KA4EPS's, telephone BBS has been getting a real workout lately. Lu has connected his packet TNC to his BBS and a caller, after first being "checked out" to make sure he has a ham license, can be patched into the TNC and get on the air. I know it has been used by Tom, W2VY in New Jersey, Ralph, W0RPK in Iowa, and many locals. The phone number is 305-969-0000, but it will be off for a about two weeks while Lu moves.

There have been a lot of messages flying back and forth on the K4NTA BBS about SSID's lately. It has been proposed that SSID 0-3 be for home and auxiliary stations, -4 for BBS's, -5 for GLB wide area digipeaters, -6 for TAPR/AEA digis, -7 for Xerox 820 and so forth. I think that the whole idea of assigning SSID's is not necessary, but we would like to hear more from others.

Another topic of message traffic on the BBS here lately has been the use of CWID's. My personal feeling is that the FCC rules don't require that a packet station identify in CW but tha you can identify in the mode that you are operating, namely packet.

You will find elsewhere in this issue of the BEACON an announcement from Howie Goldstein, N2WX, about the FADpad. I have been testing his firmware on my Xerox 820 for a about a month and I am very impressed. The command set is just like a TAPR TNC so I had no trouble learning how to work it. It has some really neat features. The main one that I like is the digipeater list when monitoring. Instead of seeing WD4BRF>W1BEL: you get WD4BRF>W1BEL via K4NTA-1*, N2WX-7 where the star (*) means that the frame you are seeing was digipeated by K4NTRA-1. It makes it nice to see what is going on without turning on TRACE. The set-up here is a Xerox 820, modem by N4AJH and FAD Board. The FAD board was designed last summer by Howie to interface the 820 to the HDLC packet protocol. Mine is wire wrapped but TAPR now has the bare board for $26.00. It uses a Zilog Z-8530A.

On the high speed linking front, Tom K4GFG is working on modificaions to some 220 Mhz. gear for use at 9600 baud. I understand that he is testing it for both FSK and for use with 9600 baud telephone type modems. Howie is about ready to wrap up the software for GATOR 1, FADCA's first try at high speed linking. It is hoped that we will be doing some testing within two months using the GATOR 1 system. Stay tuned!

Many frequency coodinators around the country have set aside 145.01, .03, .05, .07 and .09 for packet radio. This goes along with the 20 Khz. spaceing band plan for this area of two meters. I have heard of at least one state that has allocated the same sub band (145.000 - 145.100) but with six frequencies and 15 Khz spaceing. I would like to hear what you think? Should be go with five frequencies at 20 Khz. or six at 15 Khz? The extra channel will mean a lot when we start putting GATOR 1 into operation.

I am looking forward to seeing many of my friends at the big Miami Hamboree the 2nd and 3rd of February. Joel, KI4T has set up a really big packet radio

220 MHz 9600 Bits per Second Packet Operation

Chicago operators monitoring 223.500 MHz who have recently noticed their squelch breaking for no apparent reason may be hearing Steve Goode, K9NG experimenting with 9600 bits per second (bps) packet radio. A maximum length packet of 128 characters takes only 150 milliseconds to transmit at 9600 bps which is just enough time to open most FM receiver squelch circuits. By the time the FM squelch has opened, the packet is over so the FM receiver squelch closes again. The operator hears only a short noise burst. A Hamtronics FM-5 transceiver and a Hamtronics T-51 exciter and R-220 receiver have been modified to transmit and receive 9600 bps packet. Current packet operation uses audio frequency shift keying to transmit 1200 bps packet over FM radios. The modifications to the Hamtronics radios allow direct frequency shift keying of the 220 MHz RF carrier allowing transmission of 9600 bps packet. The 9600 bps radios were demonstrated at a meeting of the Chicago Area Packet Radio Association (CAPRA). CAPRA will now move the 9600 bps radios to a dedicated packet link between Chicago and Portage, Ind. These tests will work out the bugs in the radios and the controlling computers with the long term goal of establishing a packet link between Chicago and St. Louis. For more information on Chicago packet activity, contact any CW [illegible] 144.950 MHz.

On Sunday, Jan 13th, we held the second meeting of mid-Atlantic packeteers at a mutually inconvenient rest-stop on I95 near the Maryland/Deleware border. This meeting was attended by about 25 active users from the Baltimore/Washington, Harrisburg, Southern NJ, Philadelphia and central NJ. One of the first topics for discussion (after the usual, predictable software/hardware/idea swapping session) was "why do we need this group?" -- the east-coast people are beginning to feel some of the same frequency coordination problems (as relayed by KA6M) that were being felt in the SFO area with the NARC's (gawd -- what a name!). The consensus was that the packet radio community had to speak with ONE voice to the various repeater coordinating councils whose turf we encroach upon. Thus was born the newest packet group -- the MAPRC, an acronym for the Mid-Atlantic Packet Radio Council. For simplicity, we staked out our "turf" as being about 100 mile radius from the meeting place (i.e. MD, DE, S.E. PA, SNJ, N.VA, DC) -- we aren't trying to take over the whole world!

We decided that one of MAPRC's first vendettas had to be the establishment of more 220 MHz capabilities -- particularly for the EASTNET backbone. [To answer WA5MWD's inquiry, at present the only 220 activity that I know of on the east-coast is the mid-NJ work that has been reported in Gateway]. So, we are going to begin acquiring radio equipment for 220, initially for the existing digipeaters, to operate at the present [slow!] 1200 baud AND to begin working on the higher-speed links too. We are eagerly awaiting the results of Steve Goode's tests!

It was agreed that the linked PBBS's (W3IWI, WB2MNF, AK3P, KS3Q) were providing a very necessary communications conduit for MAPRC. Some time was spent on detailed user coordination discussions to use these resources. It was also agreed that the "hub" of our activities of necessity continued to be the WB4APR-6 digipeater [located only a few miles from the meeting place]; WB4APR announced (and later in the day accomplished) QRO surgery on APR-6, improving our links by about 5-6 dB.

A most interesting discussion took place led by KA9Q (representing TCP/IP/Datagrams) vs. WB4JFI+K8MMO (representing X.75) level-3 approaches. Most of us came away feeling most enlightened by this dialogue.

Our next in-person meeting is planned for early March, with the mid- Atlantic segment of EASTNET providing a conduit for on-going, on-the-air meetings. de W3IWI

:DVM>BEACON:PHIL IN TAMPA RUNNING 1000 WATTS
BEAMING EAST OPERATIONAL ALL DA

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seminar with speakers such as Lyle Johnson and Pete Eaton from TAPR, Paul Rinaldo from ARRL and Roy D. Rosner, author of "Packet Switching, Tomorrow's Communication Today." There will also be papers presented by some of your fellow FADCA members. Hope to see you there.

FADCA SQUELCH TALES
BY N4ZQ

Well here we are into new year already. I only hope that the coming year forecast for Packet is far better then the weather outlook for this weekend. Definately a good night to be on the keys, as it not fit for man or beast outside. Cold, dark and wet, Florida I love it!

1985? Whats it going to bring to packet? We don't claim to be or are we trying to be a prophet. We'll let others do that. But what is interesting, is to look back at past predictions and see how they did. And we have that capability to recheck one prediction for what packet radio would be like today. Just for the fun of it, dig out your copy of the BEACON for January 1984. It's volume 1, Issue 1. You do save your old issues, don't ya? Look on page 6 and reread "What Will Packet Activity Be Like A Year From Now" by W1BEL. It appears to me that we do have a prophet amoung us. If I was going to give this prediction a grade, I say it rates an A-. Not bad for an amateur, or is he?? For one that is a little skeptical of such things, care to wind up and take a shot for this coming year, Gwyn? Really would love to see this newsletter go to an electronic media. At least here in Florida. Try real hard to predict that one again.

Enjoyed reading the last issue in which a number mentioned the need to cut back CW IDs and/or Beacons. Seems that poor 145.010 is getting some heavy loading at times, and the excessive IDs are slowing data transfer rates down. Funny how times change. Just a year ago, again from Issue 1, the number of Florida packeteers could have been counted on 10 fingers and 5 toes. Those FADCA pioneers strained to copy a packet. Got excited when a CW ID burst thru from across the state. Probably would have given up a night's sleep to connect coast to coast. Would have loved to hear a new one come up that was printable. What a difference a year makes....

Don't know about you, but we going to give K4NTA's packet DX contest a shot from here in the Tampa LAN. Just love the the deadline Ted. You don't work for the IRS, do you? One area we going to shot for is the Houston. Sound a little far fetched? Not really. It seems that just about this time of year, we here on the West Central coast get a band opening to Texas. Don't ask me why, but it always falls into the Houston area. It must be some kind of ducting that takes place across the Gulf, and always occurs with an impending cold front. Now how will I know when this opening occurs? Easy, you see the local VOX repeater here has an output on 147.165. Houston has a repeater with an input on the same frequency. So when the once a year band opening comes along, we know immediately, as the two repeaters try to talk to one another. Now if I only knew for sure what frequency the Houston area was using for packet. If that fails, then we going to go the route that most will probably try and that is Alanta.

One of the biggest factors that got me hooked on digital communication, was the ease that Kantronics made for turning my Vic 20 into a RTTY/ASCII terminal. I've been fooling around with RTTY for a number of years prior to getting into micros, using the old green key monsters. At the time, I thought it was the greatest. But along came the computer, followed shortly with the Hamtext RTTY/ASCII program. With the state of the art system, I could do more and not have to to worry about oiling the gears. What Kantronics did was open a gold mine for the amateur. They were smart enought not to zero in one one computer, but produced a software program for most of the computers that would be found in a ham shack. It had to be a good thing, because a number of companies jumped into the action. AEA and Microlog to name a few. There's no telling how many 64, Apples or TRS's are out there in ham shacks just waiting for an excuse to put to futher use. My bet is quite a few, judging from the number of computer based RTTY stations I've worked. The point of all this is, that if we could get Kantronics to do for packet what they did for RTTY/ASCII and AMTOR, there be no telling were we be. Late word is that Heathkit could be getting into the packet business. I would think along the lines that AEA did.

Just a few brief notes worth memtioning. High speed intercity data linking hardware is showing up on 221.4 in the Tampa area. K4RHD has been hard at work and has now got a 1/4 gallon running. He along with W1BEL are running some short path propagation tests. As soon as the East coast gang get their system running, look for for some very exciting cross state tests. My guess is that 1200 BPS will be used for preliminary testing, in hopes that the coast to coast path will work. 9600 BPS to be the near future goal.

Look for improvements in a number of Digipeaters. Orlando and Clearwater areas doing system check outs, and will be located to a high site in the next month or so. Ft. Lauderdale is scheduled to go up 350 feet this weekend. This should help with the channel loading, as not as many low level digipeaters will be needed.

Stay tuned, '85 promises more exciting things to come along.

$49 Keith N4HWW>BEACON:N4HWW/R de DAVE

THE FOLLOWING THREE NEWS ITEMS ARE REPRINTED FROM 'GATEWAY,' THE BIMONTHLY PACKET RADIO NEWSLETTER PUBLISHED BY THE ARRL.

AUTOMATIC FORWARDING

From the user's point of view, the most interesting packet-radio development of the past few weeks is the implementation, by Hank Oredson, W0RLI, of automatic message forwarding. Hank is the author of The Mail-Box, a packet-radio bulletin-board system (PBBS) that runs on the Xerox 820 computer. The newest feature of The MailBox is automatic store-and-forward message handling, which allows a message left on a MailBox to be passed from one MailBox to another until it reaches its intended recipient. Our experience with the system, between Hank, in Boston, and W1AW-4 in Newington, CT, has been favorable.

Hank says, "The distributed message store-and-forward system is growing very rapidly. In the Boston area, K1BC, W0RLI, WB2OSZ, and KA1T are all using auto-forwarding. In Arizona, K7PYK is available, linked to W0RLI via HF. Other EASTNET MailBoxes now on the air, or soon to be on the air, include W3IWI and KS3Q in the Washington, D.C. area, WB2MNF in New Jersey, and W1AW-4 in Newington. At least nine other stations should be coming up in the future. The network, both real-time and store-and-forward, is growing fast."

While the easiest way to get into the store-and-forward network is to use Hank's MailBox software, experience at W1AW has shown that other PBBS software can be modified to work with the MailBox. Hank would like to get in touch with anyone working on store-and-forward techniques.

W0RLI MailBox SOFTWARE

Far from being a run-of-the-mill PBBS, Hank's program has many innovative and useful features that make it outstanding.

The program runs on the Xerox 820 computer, with 2 disk drives and a TAPR TNC.

The bulletin-board section of MailBox stores messages, transmits broadcast packets telling who has messages waiting, and delivers your messages to you when you connect to the PBBS. The addition of automatic message forwarding, as mentioned earlier, makes this a powerful program.

The MailBox also has a "gateway" or "bridge" feature which allows the Xerox to control two TNCs on different frequencies. For instance, stations on 2 meters can use the gateway to connect to stations on an HF band like 10 MHz. The gateway feature has been used to link stations from Arizona to Massachusetts.

To get a copy of MailBox, send an 8" disk, with return postage, to

Hank Oredson, W0RLI
19 N. Hill Rd.
Westford, MA 01886.

PACKET RADIO VIDEO TAPES

The Central Iowa Technical Society (CITS) was privileged to host the first ARRL Iowa Section Technical Seminar on September 22nd, 1984. The guest speakers at that convention were Lyle Johnson, President of Tucson Amateur Packet Radio (TAPR), and Jeff Ward, K8KA, ARRL laboratory computer engineer and editor of Gateway. The weekend before the Seminar, Lyle and Jeff had attended a meeting of the ARRL Ad Hoc Committee on Amateur Radio Digital Communications, and they were well prepared to present the latest ideas and agreements relating to packet-radio networking.

CITS took the opportunity to video tape Lyle's discussion of the concepts of networking and, with the addition of a segment about the Iowa networking project, they have produced a video tape called "Amateur Packet-Radio Networking."

Lyle's discussion includes a brief review of packet-radio basics, a discussion of the use and limits of level-2 digipeaters, a comparative review of datagrams and virtual circuits, and speculation on potential of packet-radio networking to provide continuous, highly reliable, error-free inter-city linking.

CITS has followed Lyle's discussion with a description of their own networking project, which includes a "link-management unit" (LMU) based on surplus Televideo 806 microcomputer boards and 220-MHz RF modems. This description is in the form of a panel discussion including John Maurer, NA0S, Dave Huffman, KA0DNB, and Ralph Wallio, W0RPK.

The video tape is ready for distribution and may be ordered in either VHS or BETA format. Please send $25 (in check made out to Central Iowa Technical Society) to:

Allen Johnson, WB0OEU
c/o CONTROLTRACK
2212 Ingersoll Avenue
Des Moines, IA 50312.

If you are just getting interested in packet radio, perhaps as a result of the December 2 TRN, CITS's first video production, "Introduction to Packet Radio" is still available through the same address, for the same cost. Funds remaining after CITS's overhead is paid will be used to continue development of packet- radio networking. From W0RPK
[FADCA has copies of both videotapes for loan to members for club and hamfest showings.-Ed.]

RATS ACTIVITY

The following summary of the activities of the Radio Amateur Telecommunications Society (RATS) was sent to us by Gordon Beattie, N2DSY.

"We've also been busy in the protocol development area. We have a draft recommendation for an international numbering plan and another in the works for a national numbering plan. The international plan closely follows the CCITT X.121. This is a particularly interesting recommendation because it allows for data users to call telephone and telex users. An amateur implementation of this addressing scheme would simplify connections between amateur and commercial networks. This would greatly enhance amateur network operations, provided that proper control and third-party traffic regulations could be observed.

"The national plan to be proposed will be based on the North American Numbering Plan used in the telephone network. Our goal was to develop an easily determined numbering scheme for use in the amateur network, and we couldn't think of a more reliable directory service than the one maintained by AT&T and others!"

[Numbering/addressing will be necessary in an amateur packet network because amateur call signs are not geographically specific enough to be used in determining packet routing. Several numbering schemes are under consideration for amateur use.- Ed] From N2DSY
[Watch for K4NTA's interesting paper at the Miami Packet Forum on this topic. - FADCA Ed.]

K4AHO>BEACON:ORLANDO, FLA...Mailbox On!

PACKET RADIO VIA TELEPHONE BBS
By Ted Huf, K4NTA

Lu, KA4EPS in Lake Worth, Florida has come up with a clever enhancement to his telephone BBS. Lu for some time has used his R/S Color Computer in BBS service in the Palm Beach County area (305-969-0000). Lu got his TAPR Kit a couple of weeks ago and the Broward Hamfest (he had it on the air in 4 hours) and now has it interfaced to his BBS. To use it, you call into the BBS and leave a message to sysop with your ham call, name, QTH and user ID number that the BBS assigns you the first time you log in. Lu checks you out to make sure you are really a ham and enters your ID in a special file of authorized packet users. If an authorized user of the packet TNC requests that option on the BBS, it loads his call in place of KA4EPS in MYCALL. and gives you control of the TNC from the cmd: prompt. From that point on, it is just like operating you own station, but you are on a phone line using a modem. To exit the TNC you type MENU alone on a line and the BBS does a RESET to the default parameters. Lu's BBS operates a 300 or 1200 Baud. The ABAUD adjustment is handled by the BBS as well. This system has gotten a lot of local hams to try packet radio right from their own homes and has sparked a lot of interest. If any out-of-towners want to talk to Florida, give it a try. You will have to make the first call with the message to sysop to get authorized and then call back a day or so later to use the system. There is a partial list of Florida packet stations under the <G>o Packet command.

N4ZQ>BEACON:N4ZQ/R * Keith in Seffner * Buffer Open

The following from Howie, N2WX, was in reply to comments by Joe, WD4KAV, about the use of the PACLEN command on the TAPR TNC:

Msg : 2375 Sec. 0
Date : 01/01/85 11:10:36
To : ALL
From : N2WX
Subj : PACLEN/FRACK/MAXF/CONGESTION

Joe, thank you for bringing up a very good point on the longer paths. I think it's a topic quite fitting in light of the myriad of paths and unpredictable band condx on SOUTHNET. What you feel about PACLEN and what the others say is true, but only partially so. On NO-DIGIPEAT connections, the PACLEN comments are correct -- a smaller PACLEN on a totally empty channel will usually allow greater throughput for marginal paths. But on multi hop paths, it's been my experience that many more frames are lost due to values of MAXFRAME greater than 1 COMBINED with FRACK at a low (<3 for ea. digipeater). For example, a path from you to WB4OAR in Orlando normally goes via K4NTA-1, N2WX-7 AND N4JWX. Assume that NTA can't hear JWX, & vice versa (a valid assumption.) I've more often than not seen QSO's zapped because of collisions at the digipeaters at either end, NTA and JWX brought on by FRACK (the retry timer) expiring before the ACK for the retried frame is received. Example; you send a frame to WB4OAR, he gets it,but by the time his ACK is retransmitted by N2WX-7, your station is possibly A) retrying the frame or B) sending a new frame because MAXFRAME can allow more than 1 outstanding frame at a time. In either case, the ACK is lost in a collision between N2WX-7 and your station. To make matters much worse, when the response from WB4OAR does make it back, its a special type -- a REJect -- and current TAPR/AMSAT software does not handle it correctly, so at this point when you get the REJ your TAPR starts sending everything it has not once, but twice. This makes it even more likely that somewhere, frames will get lost. Moreover, it takes away from other people's connections by reducing the amount of channel capacity (finite) that we all share. My suggestion to you and others who play around with long (>2 digi's) paths is to 1-Set FRACK to at least 6. This allows the remote time to ACK or send his own INFO when you can not hear more than one digipeater. 2-Set MAXFRAME 1. *MOST SIGNIFICANT* since you can't hear past 1st digi, why send more frames than the other could accept IF IT MISSES ONE. I.E., these tnc's throw out up to 6 - *correctly*- received frames if it misses the 1st one of the sequence. Combined with FRACK, I think MAXFRAME is the cause of most poor (not RF caused) connections.
SPECIFICALLY try setting your FRACK to 6, MAXFRAME to 1, and, since I think the path between you, NTA, WX, JWX-0, and OAR is just about perfect, even PACLEN 256. Make sure he does the same.

73 and happy new year,
Howie

1984 FADCA Financial Statement.

FADCA was started on Dec 7, 1983, but no financial transactions occurred before Jan 1, 1984. At 1984's end membership stood at 133. (New memberships are continuing grow since the turn of the year.) Below is the financial situation as of the end of 1984.

Income:	
1984 Dues	$1330.00
Contributions	$ 634.25
Sales (terminals, modems, etc.)	$ 645.00
TOTAL	$2609.25
Expenses:	
Printing	$ 982.18
Postage	$ 507.08
Supplies, advertisements, misc.	$ 100.42
Purchases of equipment for resale	$ 663.23
Equipment for experimentation	$ 436.00
TOTAL	$2688.91
Cash balance:	$ -79.66
Value of equipment on hand for sale:	$ 300.00
End of year status, cash/assets	$ 221.34
1985 Prepaid dues:	$ 291.00

Note: Not all contributions in kind are accounted for. Antennas, hardline, used RF gear, etc have been donated by various persons and organizations. None of this gear has been sold, and most has been used in the installation of packet digipeaters. The experimentation equipment line is managed by K4NTA and reflects the expenditure of funds from sales of terminals donated by his company.

BREAKTHROUGH IN LOW-COST TELECOMMUNICATIONS

RADIO AMATEURS COMMUNICATE WITH LOW-ORBITING SATELLITE

VITA NEWS RELEASE

USING A TINY SATELLITE NOW ORBITING THE EARTH OVER THE POLES AT AN ALTITUDE OF 429 MILES (690 KN), A TEAM OF TECHNICAL VOLUNTEERS FROM THE U.S. AND CANADA YESTERDAY SENT LETTER-PERFECT PACKET RADIO MESSAGES TO ENGLAND FROM HAWAII, AND RECEIVED REPLIES. THE TRANSMISSIONS REPRESENT A BREAKTHROUGH IN THE USE OF LOW ORBITING SATELLITES FOR WORLDWIDE COMMUNICATIONS. INTRODUCING THE NEW CONCEPT AT THE PACIFIC TELECOMMUNICATIONS COUNCIL'S ANNUAL CONFRENCE IN HAWAII, HIGHLY TRAINED TECHNICAL EXPERTS FROM PRIVATE VOLUNTARY AGENCIES IN THE U.S. AND CANADA SENT MESSAGES TO THE UNIVERSITY OF SURREY IN GUILDFORD, ENGLAND, WHERE THE SATELLITE (UOSAT-2) WAS BUILT. THE MESSAGES--DIGITIZED "PACKETS" OF INFORMATION--WERE STORED IN THE SATELLITE'S ON-BOARD COMPUTER. A FEW HOURS LATER, AS THE SATELLITE PASSED OVER GUILDFORD, THE LETTER-PERFECT MESSAGES WERE DOWNLOADED AND PRINTED OUT AUTOMATICALLY BY THE SURREY GROUND STATION'S SMALL PERSONAL COMPUTER.

USING AMATEUR RADIO FREQUENCIES, INEXPENSIVE TRANSMITTERS AND RECEIVERS, AND PERSONAL COMPUTERS TO COMMUNICATE WITH A LOW-ORBITING BIRD, THE SYSTEM THAT WILL UTILIZE THIS TECHNOLOGY IN THE FUTURE (ALREADY KNOWN AS PACSAT), WILL OFFER TELECOMMUNICATIONS NETWORKING AT A FRACTION OF THE COST OF CONVENTIONAL TELEXES. ONCE OPERATIONAL, THE PACSAT SYSTEM WILL PROVIDE ORGANIZATIONS THROUGHOUT THE WORLD MUCH-NEEDED ACCESS TO LOW-COST, RELIABLE TELECOMMUNICATIONS. GROUND STATION EQUIPMENT, COSTING NOT MORE THAN $2000 AND CAPABLE OF OPERATING ON BATTERIES OR SOLAR POWER, CAN BE CARRIED IN A BRIEFCASE. THE FIRST FULL-SERVICE PACSAT SATELLITE IS SCHEDULED FOR LAUNCH ON THE SHUTTLE IN EARLY 1987.

SPEARHEADING THE DEVELOPMENT OF THIS TECHNOLOGY ARE VITA (VOLUNTEERS IN TECHNICAL ASSISTANCE), A PRIVATE VOLUNTARY DEVELOPMENT AGENCY IN WASHINGTON, D.C. THAT SPECIALIZES IN TECHNOLOGY TRANSFER; AND AMSAT (RADIO AMATEUR SATELLITE CORP.), AN INTERNATIONAL ASSOCIATION OF HAM RADIO OPERATORS WHO ALSO DESIGN AND BUILD SATELLITES. INTERPARES, A PRIVATE CANADIAN AGENCY ENGAGED IN COMMUNITY-BASED DEVELOPMENT, SUPPORTS THE EFFORT IN CANADA.

To: All packet radio stations
From: Hank Magnuski, KA6M
Date: January 5th, 1985

Subject: Network Coordination Agent

At the December meeting of the Pacific Packet Radio Society, PPRS, we had a fairly long and involved discussion of frequency usage in this area, starting with a review of what frequencies were currently in use by packet radio operators in this area, and ending with some conclusions that may be of interest to the packet community.

First, let me give a little background information. We have in this area, as most major metropolitan areas also have, a group which supervises and coordinates frequencies, primarily repeater frequencies. Locally this group is known as NARC, and I'm not sure what the letters stand for, but something like Northern Amateur Radio Council. For many years NARC has played an advisory role, assigning and coordinating sites for 2-meter repeaters, and looking after allocations on the other bands as well.

Pro-NARC view - The role of NARC is changing (thanks to the FCC) from an advisory one to a supervisory one with an almost quasi-legal status, such that a conflict of use of frequencies can be decided by NARC and the operators must abide by the decision issued. The FCC will side with the NARC directive. Thus packet frequencies must be also be rubber stamped by NARC and we must plead our case before their alter or we may eventually get in trouble with the FCC if we do not have the approval.

Anti-NARC view - The NARC people wouldn't know the difference between a simplex digipeater and a crowbar, and the rules of the game are so different in that multiple repeaters are actually encouraged to be on the same frequency, so the thought of NARC ruling on the placement of digipeaters, gateways, network protocols and the like is pure fantasy and would be a technical hindrance and a disaster. Keep them out of packet radio and let them continue to fight over all those full duplex voice machines.

A consensus, of sorts, was reached at the meeting and goes something like this:

The NARC people are dealing with very real problems of crowded frequencies, overlapping repeater coverage, intermod, etc., and it would be a good idea and to everyone's benefit to formally propose and establish packet radio frequencies and have them officially "coordinated" by them.

However, once the slot is established, NARC's jurisdiction ends and a new type of advisor is needed. This advisor must help track and promote the rational growth of packet radio equipment, repeaters, gateways and protocols on the assigned frequencies, and may assume, in the years ahead, a supervisory role in that capacity.

I have seen the need for such an advisory council in other parts of the country, as the growth of packet radio necessitates changes in operating habits. Interested hams are meeting to discuss these problems at statewide conventions, and even regional meetings are being held at rest stops on major expressways.

Therefore, I would like to propose a new term for amateur radio, the "Network Coordination Agent." The NCA for a given area deals with the problems mentioned above, and also represents that area in national matters when decisions need to be made on protocols or other issues.

One final conclusion of our meeting, and this was the consensus of the group, is that the PPRS, being the oldest and largest packet radio group in the San Francisco area, and not being controlled by any one special interest group, and having as its members radio amateurs from cities all around the Bay, will now assume the role of NCA for this region.

WB8?PE>BEACON:Brad in Brandon, Connects saved.

FADCA>BEACON

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association (FADCA), 812 Childers Loop, Brandon, FL 33511. FADCA is a non-profit organization devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO	Dave Frey, K3AAX
Ted Huf, K4NTA	Dick Klein, W4PCM
Tom Kneisel, K4GFG	Gwyn Reedy, W1BEL
Bill Sams, KF4LG	Bill Whitaker, WD4JKM

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self addressed, stamped (54 cents) 8 1/2 by 11 inch envelope to the FADCA address.To join, complete the membership application enclosed and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

DIGITAL EVENTS

FEBRUARY 2/3. M1AM1 Hamboree and Packet Seminar. Dade Radio Club/FADCA Conference on Applications of packet radio, 10 AM Sunday. Contact KI4T or WD4JKM.

FEBRUARY 9. Inverness Hamfest. Contact SHARC, P.O. Box 2543, Homosassa Springs, FL 32647.

FEBRUARY 9/10. Tucson Amateur Packet Radio, Inc. (TAPR) annual Board of Directors meeting in Tucson.

FEBRUARY 16. STUART Hamfest. Packet demonstration by K4NTA.

FEBRUARY 23. Ft. MEYERS Hamfest with FADCA booth and lecture. Contact KB4CIA or W1BEL.

MARCH 2. HERNANDO County Hamfest. FADCA participation being arranged.

MARCH 9/10. ORLANDO Hamcation. FADCA presentation and demonstration both days. Contact K4AHO.

MARCH 30/31. 4th ARRL Computer Networking Conference, San Francisco.

The deadline for submission of material for the February issue of the FADCA > BEACON is February 14. Articles should be in final form using a 53 character line length. Electronic media is preferred, but all forms of input will be considered. The most convenient methods of submission are via DRNET or the Stuart BBS. Direct transfer via SOUTHNET or telephone modem can be arranged. Contributors should watch this space each month for revised and updated instructions.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00
Half page	$17.00
Quarter page	$10.00
Eighth page	$ 6.00

Small classified advertisements for FADCA members will be without charge.

Rates are based on a monthly circulation of 250 copies. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

MEMBERSHIP DUES

FADCA membership dues for 1985 are payable as of January First. The basic dues are $12.00, but because of the 1984 dues incentives, each individual's 1985 dues may vary. See your address label. If 1985 appears, your dues are paid up. If 1984 appears, your dues appear in parentheses following the year. If the line following the callsign is blank, you are receiving a complimentary or introductory copy. If you enjoy the BEACON and support FADCA's work, please give serious consideration to applying for membership. Be sure to bring any mistakes to our attention. Dues payment is requested by check, payable to FADCA.

THE FLORIDA AMATEUR
DIGITAL COMMUNICATIONS ASSOCIATION
812 Childers Loop
Brandon, FL 33511

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 2 Brandon, Florida February 1985

NEWS AND VIEWS

Gwyn Reedy, W1BEL

I got my Novice ticket when I was 12 years old, and ham radio kept me completely occupied for several years. Then I got the fever to drive a car (about the same time I got YL fever...). Each summer evening when I was 15, I would get the family auto out and wash and polish it, accompanied by frequent starting of the engine and moving about the yard. My eighteen year old neighbor earned considerable spending money by washing and waxing autos for local residents. I thought polishing a car such a pleasant passtime, and had so much time on my hands, that I could not comprehend why someone would pay to have his auto cleaned instead of doing it himself. I also yearned to be a race driver and could not understand why wealthy persons would own a race car and not want to race it themselves. Now that 28 years have passed, I understand the answer to at least those two things that puzzled me then: TIME!

Packet radio has many interesting facets. It is an ideal haven for experimenters (RF, digital, software), a new challenge for repeater operators, a great hope for the traffic handlers, and a place for computer-active hams to meet and feel at home. It is all those things to me and much more. Although it consumes nearly every free moment I now have, I consider packet's greatest advantage to be its potential for saving my time. The ability for the network to collect and summarize information for me (customized for me, just as each other participant can receive custom summaries) will be a tremendous aid to keeping informed. Referring again to the past, There were times in my life when I would meet every evening with my friends in a local hang-out, and that location became an aid to communication. People knew where to find me, and all of the people I was interested in were found there. Now my span of interests has changed and broadened. There are numerous facets of amateur radio, computers, and technology-watching in general that I wish to know about. Right now I don't have a single 'hang-out' but have to circulate among a number of them to keep in touch with my diverse friends. One of these days, I expect a packet radio based information system will provide me with that capability. My computer will receive information and personal messages from all over the world via the amateur packet network, and combine that with similar information derived from the public communications services. Why such an important role for the amateur packet network? That is where most of my friends are, and many of my interests are centered there. I believe in time the amateur packet network will become a significant information utility.

What does it take to make a packet network into an information network? Information (data bases of technical and other information), a place to store it, and a means of selecting the desired portion of information. That means a large computer, a database management system, and lots of people keeping a data base full of useful and interesting information. We have the people, and are rapidly getting the network to transfer the information in and out. WHERE CAN WE GET ASSURRED ACCESS TO A AT LEAST A GOOD MINICOMPUTER ? That should be a high priority project for FADCA during the coming year.

FADCA has a new benefactor that I wish to publicly acknowledge. Phil LaMarche, W9DVM, has agreed to underwrite FADCA's postal charges for BEACON publication. That substantial support will allow us to pursue our goal of education (see FADCA's statement of purpose on the back cover) with less concern for running the budget in the red. Phil has also arranged for FADCA to obtain 100 8530-A SCC chips that we can resell at the bargain price of $20.00 postpaid. I encourage all FADCA members to support the organization in the spirit of this outstanding member. If each member will recruit one other member this year, we can reach a membership of over 300. (Note that this BEACON contains a separate sheet membership form and explanation of FADCA. Pass it to a membership prospect.) What's the purpose in growth, you say? Remember that minicomputer and the information system. Think of all the link nodes that need to be built and operated. Think how useful we can be in emergency support if we have a truly robust and well implemented network. Those projects take money, and they also take organization and the cooperation of all concerned. Next packet QSO you have, inquire of the other operator if he is a FADCA member. One of our Directors, Dick, W4PCM, is working on getting FADCA incorporated as a non-profit corporation. That should assist us in fund raising with the business world.

FADCA has joined the Florida Repeater Council. Next month the BEACON will carry the text of a letter from FRC appointing FADCA as the Packet Coordination Agent for the state. Our role will be to adjust the frequency assignments of various LANS to limit interference among them. Next month I hope to run an article analyzing a possible frequency utilization scheme developed by Ted, K4NTA.

The centerfold this month is a map of SOUTHNET. I should say a partial map of SOUTHNET, because I do not want to limit it to the area depicted. There seems to be no value to having each state or local area name and operate its own linking scheme. FADCA coined the SOUTHNET name, but we willingly offer it as the name of the digital network for the entire southeast area. We also are eager to join forces with other groups (as they become ready) in a regional SOUTHNET governing body. I propose it be called the SOUTHNET Coordination Council (SCC). What do you say, GRAPES and SAPS?

My apologies for the quality of the newsletter last month. The printer must have never read a newspaper with a single sheet center page, for he didn't understand what was requested for the BEACON. The picture was a disaster too. If they turn out, I will try to run a picture of the FADCA/TAPR booth at the Miami Hamboree in this issue.

The Hamboree was very enjoyable and very successful for the packet mode. A booth was manned both days by TAPR and FADCA personnel. Over 300 sets of introductory literature were handed out, and 9 TAPR kits were sold. The Packet Applications Symposium was well attended. Eight papers were presented, and much enthusiasm for packet was generated. Pete Eaton, WB9FLW, gave an updated version of his introduction to packet radio that so many of us have seen on video tape. He kept everyone on the edge of their seats. Paul Rinaldo, W4RI, and Lyle Johnson, WA7GXD, also honored us with their attendance and presentations. The remainder of the speakers were FADCA types, namely KI4T, K4NTA, N2WX, and W1BEL. Some of the papers will be published in the proceedings of the Fourth ARRL Computer Networking Conference.

Heath announced and displayed their HD-4040 packet terminal at Miami. It is a TAPR clone in a Heath style cabinet. It will be available in April as a kit for about $300, including cabinet. Heath indicated serious interest in providing additional equipment for packet use, including linking. Several other manufacturers indicated plans to produce packet gear later in the year, but would give no specific details.

FADCA has just concluded a 15 unit Xerox 820 group buy. There are several persons that missed out and would like to do another buy. If interested, contact me. Another group buy has been for the Emerald Microware double density disk controller add-on board. Further news on that one when someone gets it up and running. Also in the equipment line, be sure to read the announcement of N4AJH's modem availability elsewhere in this issue.

This month I'm very pleased to add two new columnists that will cover two important and often requested areas: Emergency communications, and help for the newcomer. Welcome Steve and Don.

EMERGENCY COMMUNICATIONS

Steve Crowley, N4AIY
614 Sanfield St, Brandon, FL 33511
(813) 689-9714

One of the basic principles of being an amateur radio operator is stated in part 97 of the FCC regulations. It states - Recognition and enhancement of the value of the amateur service to the public as a voluntary non-commercial communications service, particularly with respect to providing emergency communications.

In Hillsboro County, the responsibility for planning and coordinating response to an emergency is delegated to the Bureau of Emergency Management. In the past this activity was referred to as 'Civil Defense.' Other counties have similar arrangements, although they may have different names.

In Florida, one of the major emergencies we can be prepared for is a hurricane. In the event of a hurricane, the communications abilities of the amateur community will be required in order to handle communications between hurricane shelters and the emergency coordinator. In Hillsboro County 38 shelters have been established, primarily schools in locations above any anticipated storm surge. These locations have been assigned for emergency communications purposes to amateur radio clubs in their area, and the responsibility lies with the clubs to supply communications. For the most part, this will be via 2 meter hand-held or mobile battery operated equipment.

For those of us whe have listened to the emergency nets in other areas in recent years, we know that another part of the amateur activity is passing traffic in and out of the area affected by the emergency. A tremendous amount of this traffic is from relatives and friends checking on those in the area. Also in some cases, amateurs with emergency power capabilities are the only available communications contact. Thus we as amateurs can be a vital part of emergency planning.

In my own mind, as local packet radio digipeaters are put in operation, plus the repeating capabilities of the individual stations, we can expect that an emergency digital communications network can be established. This could be established upon notification of an impending emergency, and after the cause of the emergency has passed, be available to transfer accurate information in and out of the emergency area until normal communications channels reopen.
Each amateur radio club should have an individual assigned as Emergency Coordinator (EC), and he should be in close contact with the ARRL Section Emergency Coordinator (SEC). The club EC is responsible for getting communicators assigned to the locations and seeing that the locations are manned during the emergency.

FADCA members are in a position to be of great assistance in case of an emergency and all us us should be giving thought to what we can do as individuals and as a group. All suggestions and comments regarding participation during an emergency will be appreciated. Look for me on 145.01 packet (anytime), or on 3838 KHz daily at 0930 and 1900, or write to me at the above address.

MEMORANDUM FROM SOL LIBES

I'm back into magazine publishing. When Microsystems magazine died I received countless letters and phone calls from devoted subscribers urging me to do it again. I kept remembering what we went through when we started Microsystems, and I said no, not again. But, lets face it, there really is no other magazine that caters to the advanced micro user the way Microsystems did.
So I am starting a new magazine in the tradition of the old Microsystems, when I was editor. Lots of parctical info, strictly technical info, no fluff. Stuff to keep every hacker up-to-date on the ever-changing micro technology. Software and hardware tutorials and reviews, public-domain software info and reviews (SIG/M, PC/Blue, PC-SIG, C-User Group and more), CP/M, MS/DOS, Turbo DOS, C, Pascal, Forth, Lisp, and of course Assembler. S-100, IBM-PC, single board computers, multi-user systems. A real micro systems-oriented journal...in fact, that will be it's name -- MICRO/SYSTEMS JOURNAL.

The first bi-monthly issue is already in production. Subscribe before April 15th and deduct ten percent. Contact MICRO/SYSTEMS JOURNAL, P.O. Box 1192, Mountainside, NJ 07092. (201) 522-9347.

GETTING STARTED

A Beginners' Column by Don Deem, KB4LLO

During a discussion at the Sarasota Hamfest, it was mentioned that there is a real need for a column in the FADCA>BEACON devoted to beginners; those just getting started or thinking about getting started in packet radio. This column is the direct result of that discussion and will attempt to meet the needs of our growing readership. As a beginner myself, I have experienced many of the frustrations that confront the newcomer and intend to prepare this column from that point of view. But, in order to best serve you, I will need input from those who are experiencing specific problems or difficulties. So, I'm asking you to drop me a line describing your particular problem as completely as you can, including a drawing if necessary, and I will find your answer. Of course, all questions and answers that are of interest to BEACON readers will be included in this column. You can send your letters to the FADCA address in Brandon, or directly to me:

DON DEEM, KB4LLO
4811 29th Av. Dr. W.
Bradenton, FL 33529

I have two tips for beginners to initiate the first column. The first is... If FADCA is doing a demonstration at a hamfest nearby or at your local club, DON'T MISS IT. Those FADCA persons who do the demonstrations and seminars are always looking for help. Volunteer to help, and you will be amazed at how much you will learn in exchange for the minimal effort you will be asked to put forth. Besides, you will meet some very nice people! Secondly, check your BEACON for the listing of voice nets that are held weekly all over the state. Do yourself a favor and check in and take part. If you have questions, ask them. You will find FADCA peaole eager to help, and glad to meet you.

The two most-asked questions at the Sarasota Hamfest were: "How do I get on the air?" and "What equipment do I need?" In Florida, the primary packet frequency is on two meters (145.010 MHz), so you need only a Technician class of amateur license to participate in packet radio. A basuc packet system would be made up of a two-meter transceiver, a dumb terminal (a keyboard and display with no computing capability) or a microcomputer with so-called terminal or communications software, and a terminal node controller (TNC). TNCs are available from many sources and selection may appear to be very difficult. My suggestion is to get on one of the nets and see what type of gear is most popular in your area. I must say that while FADCA does not recommend a particular brand of TNC, the membership seems to favor the TAPR unit. If you need literature describing any of the available equipment, send a SASE to FADCA or visit the FADCA display at most any Florida hamfest. Equipment is often provided by the manufacturers for display at hamfests.

Once you have your system assembled and you feel that you are ready to attempt your first CONNECT, contact a packeteer living close by, slide off to a local simplex packet frequency, and work through the normal sequence of commands. You will find experienced packeteers very willing to assist you over your initial unfamiliarity and allow you to make a very smooth transition from voice to packet radio operator.

That's it for now. Remember, send your letters and problems, and suggestions. 73...DISCONNECT.

QFPN (All Florida Packet Net)
Ted Huf, K4NTA

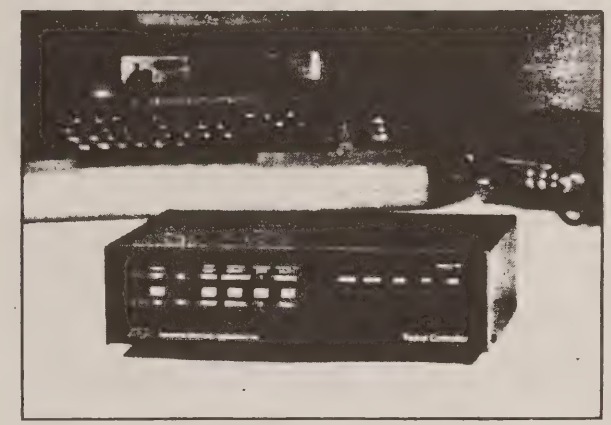
In Janurary I started reporting message traffic on the SOUTHNET Stuart PBBS to the Section Traffic Manager. At this time I am not sure if the STM recognizes QFPN as part of the Nation Traffic System or not. One thing that will give packet recognition for its traffic handling capibilities is for us to use packet for relaying formal NTS traffic. N2WX and KF4I have been using the Stuart PBBS to relay formal traffic for over a year. We would like to hear from any traffic handlers who use packet radio to relay traffic.

QFPN Janurary 1985 Net Report:
Checkins = 815
Traffic = 473

So You Want To Try Something New? How 'Bout The AEA Packet Breakthrough!

Because:

You want to recreate the thrill of your first ham contact!
You'd like to learn something new!
You want to send error-free messages on HF/VHF/Satellite in spite of QRM!
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.



In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

```
AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA
   PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:
```

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5-6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

See your favorite AEA dealer, clip and send the coupon, or call John Gates, N7BTI (the AEA Packetman) at (206) 775-7373.

AEA INC., P.O. BOX C-2160, LYNNWOOD, WA 98036
OK AEA, send packet information to:

Name _____ Date _____
Street _____
City, State _____
Zip _____ Call me at _____

Advanced Electronic Applications, Inc.
P.O. BOX C-2160 • LYNNWOOD, WA 98036
(206) 775-7373 • TELEX: 152571 AEA INTL

CLEARWATER DIGIPEATER
Andy DeMartini KC2FF

By now, many of you have seen the new callsign KC2FF-7 going by on your screens. That's the ID of the first dedicated wide-area digipeater to go on the air in the Tampa Bay area. This new facility is the rsult of a project which took its first steps at last year's Sand Key Hamfest. At the Hamfest, a few hams here in the packet booth, and the digipeater topic came up. Even though there had been a lot of support and some equipment donated, the project hadn't gotten any results. Then along came Dave Renaud N4HWW. Dave had just completed a TAPR TNC kit and was looking for some locals for his first contacts. When the conversation drifted back to a digipeater, Dave said that he had access to a very good site on the beach. The building in mind was 21 stories tall, with two floors of mechanical equipment to the roof. This puts the elevator house at about 230 feet above sea level (and ground level). There was an enclosed room in the elevator house with electricity and some commercial remote base equipment already installed. A visit to theroof top confirmed our expectations. Tampa's skyline was clearly visible some twnety miles away! So, with some high expectations, we set out to put the RF and digital equipment together.

At the next packet breakfast, a four-bay dipole was donated. The phasing harness was a bit old and stiff, so an order went out to Cushcraft for a new one. I started calling around for a second-hand commercial grade transceiver. We wanted something rugged which could be left alone. We came up with a General Electric MASTR PRO transmitter, receiver and rack-mounted power supply. This rig tuned up nicely on 145.010, putting out 125 watts and breaking squelch at 0.3 microvolts!

Next, I set the rig up in a corner of the shack and connected our "loaner" TNC from Bob K4OQ. The signal couldn't be heard more than a few miles away, but everyone out on the beach gave it a workout. After speaking with Ted K4NTA (who uses the same GE equipment at his digi) I felt confident that it would work well with the addition of a receiver preamp. So off to Advanced Receiver in Connecticut for one of their GaAsFETs. Then, it was ready to go.

The first attempt at installing was called off by rain and high winds. But, on the next Saturday, the weather cooperated. Pat KF4EF and I met at the building and went straight to work. A chill in the morning air wore off as the sun rose higher in the sky. We got a good feeling for the site's quality when W1BEL responded to a call made on an HT. "Weak but readable" was his response from (40???) miles away. Already, we could hear packets going by. Things got about 9 db better when the antenna went up.[The antenna configuration is unique for a four-bay dipole. Instead of the usual vertical stacking, we mounted them in a square. We did this to minimize street-level "visibility". The antenna has been paintedto match the building color and is now very difficult to see.]

With an attenuated signal from Bill K4RHD, we tuned thereceiver to the antenna. Voice tests reported our signal loud and cleaqr, full-strength on the "S"-meters, from everyone listening and we heard everything coming back just as strong. All work was done, so we hooked up the TNC and gave K4RHD a green light. His connect with W1BEL was the first contact and only one of many to come.

Future plans are to install an 820-based TNC. This willgive users the immediate benefit of the "heard-log", just like N2WX-7. The access to this log will be via anunconnected packet to the repeater with "/CLWLOG" in the data field. In response, you will receive a list ofthe 28 previous callsigns heard by KC2FF-7. The 820-TNC will otherwise function just like the current TAPR unit.

Farther out, we hope to install the GATOR-1 linking system. As you've seen in other BEACON articles, this new networking protocol will make inter-city routing much easier.

Whenever a project like this occurs, many people are contributors. I would like to thank the following people for their support and contributions. Some you will recognize, some you will not, but they all helped get it on the air --

W1BEL	Gwyn	WB4CKC	Craig
KF4EF	Pat	N4HWW	Dave
WA4IBM	Bill	K4OQ	Bob
KA4WNZ	Art.		

FROM THE K4NTA BBS.

Msg : 2983 Sec. 0 - ROUTINE
Date : 02/10/85 19:50:54
To : ALL
From : K4AHO
Subj : ORL Hamcation

The Orlando Hamcation will be held at the Orlando EXPO Center March 8,9,10. Tickets are available pre-purchased for $5.00 and $7.00 at the door. Swap tables are available for $15.00 (no power). The address for tickets and swap tables is;

Orlando Hamcation
PO Box 15142
Orlando, FLA, 32858

Dont delay, they will go fast!

Msg : 2984 Sec. 0 - ROUTINE
Date : 02/10/85 20:14:17
To : ALL
From : K4AHO
Subj : FADCA Meeting!

CFPA will host FADCA with a commercial booth at the Orlando Hamcation as well as two two hour forums. The Saturday forum (3:00 to 5:00+) will be FADCA general membership meeting with the theme of Interface/Operation/Applications. There will be a number of presentations and talks given. Tentatively:

GLB Interface & Operation	by Marty	WB4OAR
Hi-Speed Linking	by Ted	K4NTA
Q/A on the Xerox 820	by Howie	N2WX
TNC/Radio Interfacing	by Tom	K4GFG
Packet Applications	by Bob	WD4BIW
SAPS Report	by	K4DPF

Sunday will consist of two one hour video tapes. The first will be for beginners, the second will be the Central Iowa linkinfg tape. The Dinner is still uncertain at this time. More Later!!! For information or suggestions contact me, Jim Diggs, 305 660-2468.

NON - ELECTRONIC MAIL

1421 Hampton Ridge Road
Norcross, GA 30093
January 29, 1985

Dear FADCA,

I have been in Atlanta now for about 4 weeks and am just about settled in. My new job has taken me to the far corners of Georgia. Everywhere I go, I keep tuned to 145.01 looking for activity. I attended my first GRAPES meeting last weekend and was very impressed with the level of activity here in the metro Atlanta area. I am sure there were at least 20 hams in attendance. Since I wanted to get involved in what was going on, I jumped in feet first and offered to be a liaison between GRAPES and all the other packet groups in Georgia. My main objective is to keep abreast of packet activity in the state and to act as a clearinghouse for packet information for the GRAPES newsletter. I am going to attempt to keep other groups such as FADCA, TAPR, and ARRL informed.

Currently packet activity centers on two frequencies in metro Atlanta. WB4GQX-1 on 145.01 and KD4NC-1 on 13/73. The mountain top location of GQX is working well. Recently a phone link has been made to the digipeater for future use, and construction of emergency power for the digipeater is about 50% complete. Work is underway to install a more effective antenna system to increase coverage. A site for a second digipeater has been obtained by N4KXT at Lake Burton, with an estimated elevation of 2500ft.

There has been much discussion on the use of 450 MHz and 220 MHz for linking. KD4NC is working toward establishing a primitive network on 450 MHz using an 820 board. The problem with this frequency is the restriction to 50 watts power output because of the over-the-horizon radar at Warner-Robins AFB in Macon, and interference caused by the radar. Reports indicate that when the unit is operating, communication is nearly impossible.

I will provide a report on the statewide meeting to be held in Macon, Feb 9th. I'm looking forward to my next issue of the BEACON.

73,
Bill Crews, WB2CPV

---

220 MHZ LINKING EXPERIMENTS - PART II
BILL HITE K4RHD

* NEW FREQUENCIES - Jim (W4APV) contacted the Florida Repeater Council to request additional packet channels for use in Florida. The frequencies of 221.720 and 221.780 were assigned for packet LAN use. This should encourage greater use of the 220 band for local communications and allow 221.400 and 220.570 to be used exclusively for linking activities within the state and hopefully beyond as time progresses. We now have the frequencies, so lets get on and start making some "220 packet racket" folks.

* FEEDBACK - In my article last month, I mentioned a surplus F.A.A. power amplifier (AM-6155) that was purchased from Fair Radio Sales Co. In retrospect, I called Fair Radio to enquire about the current availability of that device and if any spare parts might be available also. I was told that ALL units had been sold and they could not speculate if other units would be forth coming and that the only spare parts they had were from damaged units that were unsold. I apologize if I mislead anyone. If anyone has knowledge of these units or other surplus 220 gear being available elsewhere, please let us know. I understand that the F.A.A. is up-grading their equipment at many airports and if we could bid directly on their surplus gear, maybe a significant savings and benefit could be realized in our linking endeavor. So keep an eye or ear open --- just in case.

* HARDWARE DEVELOPMENT - We have entered the very early stages of planning which hopefully will lead to the development of some medium to high speed linking hardware. In order to stay within our guidelines of using readily accessible equipment, the following preliminary design has been laid out: (1) Hamtronics LNG-220 GaAs FET preamp front end; (2) Hamtronics CA222K 220 to 30 MHz converter for first mixer stage; (3) Hamtronics P30K 30 MHz preamp for 1st IF stage; (4) Motorola MC3356 DIP chip Wideband FSK Receiver.

The MC3356 includes an oscillator and mixer, limiting IF amplifier, quadrature detector, audio buffer, squelch, meter drive, squelch status output and data shaper comparator. The on-board oscillator-mixer will be crystal controlled to produce a 10.7 MHz second IF so that stock model filters (and IF amplifiers, if needed) can be utilized from "off the shelf" supplies. Ideally, the only in-depth receiver design required will be the support circuitry surrounding the MC3356 chip and the electro-mechanical interface between the various purchased subassemblies. See Figure 1. for a block diagram detail drawing.

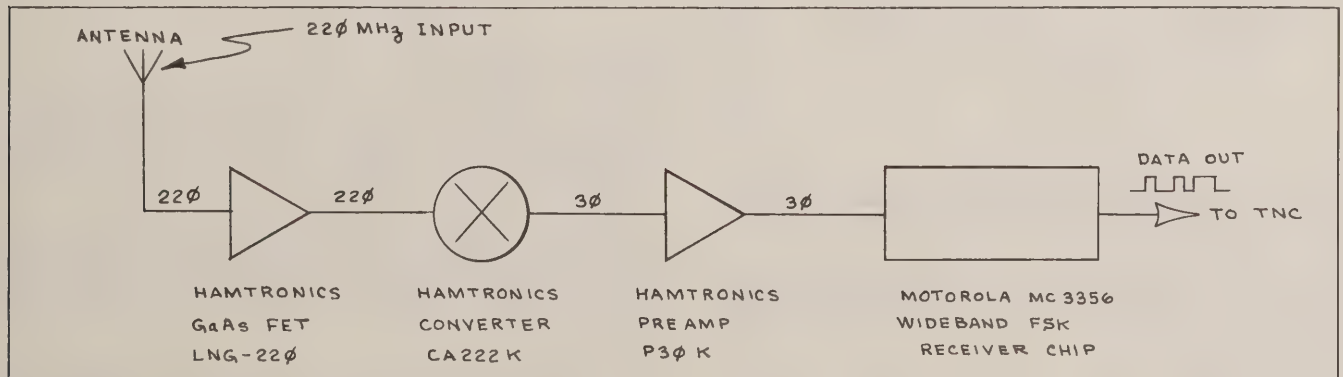
For the excitation, a GLB Electronics, Model SS1A phase locked loop frequency synthesizer has been selected. Several methods of modulating the synthesizer are possible and each will be explored during the design phase. For the first experiments, I plan to feed the synthesizer output directly into the crystal oscillator circuit of my Midland 13-509 transceiver, which in turn will drive the power amplifier. It was pointed out that a slight modification would have to be implemented within the multiplier chain of the Midland to change the final multiplier from 12 to 9 times the crystal frequency in order to use the synthesizer in place of the stock crystals. However, this doesn't seem to be a big task.

As the development progresses, the Midland will be replaced with a self contained exciter-amplifier with power sufficient to drive the surplus amplifier to full output of 250 - 350 watts.

* ANTENNA SYSTEMS - Another very important design effort will be in the area of antennas. Reliable yet inexpensive high gain antenna arrays will be needed if the long haul troposcatter technique is to be successful. A wealth of design data is being accumulated by W4APV and KF4JU, most of which is based upon the original design efforts of N.B.S. (N.B.S. Technical Note 688). Ed (KF4JU) has built a few experimental 220 models with excellent results. His experience and test results will surely be utilized in the very near future. I expect these antennas to be very cost effective and should go a long way toward reducing the overall linking cost as well as providing reliable service. More on this subject as more data becomes available.

Another important device will be the transmit/receive switch (TR switch) more commonly called the antenna change-over relay. Good antenna relays, ones that will handle high power with low SWR and low insertion loss, are VERY expensive. Eighty dollars and up are not uncommon prices for new units with "N" connectors. However, not even considering the high price there are several other undesirable features of a mechanical relay when used in packet switching service. The first is the limited service life of around a million cycles. From my experience, for this service life to be fully realized, some maintenance is necessary such as contact cleaning. In most cases the linking digipeaters will be in an unattended location and periodic maintenance trips to service a relay would not be my idea of a reliable installation. Another is the switching time necessary for the contacts to close and open. Several tens of milliseconds are required which doesn't sound like much until you consider the speed of packet switching. Multiply this time by the many hundreds of closures per day and it will add up to a significant number of packets that could have been sent instead of dead relay time.

One solution to the relay problem is to use solid state TR switching technology incorporating PIN diodes. Unitrode Corp. has a very broad line of PIN diodes which should fill the needs of Amateur service including one KW power levels. Several Amateurs have pooled their resources to effect a quantity buy from a local parts vendor and soon we should have some active design efforts underway towards solving the RF switching problem both from a reliability and cost point of view. More will certainly be printed about the results of this pursuit in the near future. [73]



SYSTEM DIAGRAM OF WIDEBAND FSK RECEIVER
FIGURE 1

EXCERPTS FROM OTHER PUBLICATIONS

HEATHKIT TNC
(From THE GATEWAY)

Those lucky enough to attend either the Miami Hamfest or the TAPR Annual Meeting have seen the second entry into the "TAPR-clone" field. The Heathkit HD-4040 is a TAPR TNC in a brown and beige low-profile cabinet. Status-indicating LEDs are grouped on the left side of the front-panel, and the only switch on the unit is an ON/OFF switch on the right side of the panel. Inside, the HD-4040 is purely a TAPR TNC, complete with modem-configuration headers and AC power supply. The kit will sell for $299.99 and should be available by the second week in April.

The kit will feature an "improved" TAPR manual. Considering that theTAPR manual is one of the best seen in amateur radio, the Heathkit manual should be a superb document. Parts for the HD-4040 will come on an adhesive strip, in the order that they are required in kit construction. This packaging technique makes parts-list checking unnecessary, and should make con struction go quite quickly.

The HD-4040 will bring two new marketing techniques to Heathkit: For the first time, the Heathkit TNC manual will explain how to connect a Heathkit accessory to non-Heathkit radios. Also, Heathkit will probably be selling the HD-4040 in a specially-priced package with another manufacturer's assembled and tested amateur radio transceivers.

Wayne Wilson, Heathkit's Product Line Manager for General Consumer Products, attended the TAPR meeting. Mr. Wilson believes that packet radio could breath life into the sagging amateur-radio industry. Heathkit is eager to build connections between amateur radio and computers, hoping that technically-inclined youth can be drawn back into amateur radio.

TAPR will continue to produce the TNC kit as long as there is demand for them. Most of TAPR's research and development funding comes from TNC sales. TAPR made the TNC available to commercial interests believing that packet radio is a field with room for more than one manufacturer. With nearly 2000 TAPR TNCs sold, they are being proven right.

M 11821 Lyle Johnson (WA7GXD,2973) 2/16/85 3:42 PM
KEYS:/INTERFACING HELP NEEDED/

Distribution: WIDEST POSSIBLE

I am presently compiling a list of hardware and software that can be used by a computer neophyte to interface to a TNC, such as the AEA, GLB, Heath, TAPR, or VADCG units.

I am especially interested in cabling requirements, other than that shown in the crude figure below, to allow the simplest form of RS232 interfacing (ie, ignore DCD, CTS, RTS, etc. - just use TxD, RxD and SigGnd).

```
TNC (DB-25)          COMPUTER (DB-25)

    2 -------------------- 3
    3 -------------------- 2
    7 -------------------- 7
```

"Crude Figure"

I would also like to know of any simple, cheap or public domain programs available. The idea is to make it as painless and CHEAP as possible for a packet newcomer to get on the air.

The information compiled will be released to all users on DRNET. I am especially interested in information for the following computers:

Commodore VIC-20 and C64
IBM PCjr. and PC.
Radio Shack TRS80-1,-3,-4, and Color Computer
Apple][,][+, //e, //c, Macintosh
TI 99/4, 99/4A

Any listings of SIMPLE, DUMB terminal programs would also be appreciated. Sources of CHEAP commercial programs are also welcome.

Please direct your responses to WA7GXD or DRNET #2973. Thank you for your help!

Lyle Johnson, for TAPR

M 3781 Packet Status Register (PSR,2980) 1/26/85
KEYS:/PSR "REPORTERS" WANTED!/

In 1985, the editorial policy of PSR is going to change somewhat. Instead of printing anything and everything of some redeeming value that is sent to us, we are going to try to limit it to 8-10 pages every 2 months, concentrating on what is going on around the world in the various hotbeds of packet activity.

To that end, we are requesting one or more volunteers from each area to be PSR's "regional correspondent". We will be soliciting up to a columns worth (that's 83 lines of 50 characters each) from anyone that is willing to submit it on a semi-regular basis.

What kind of text do we want? A summary of what has been happening in your area will suffice. A new public PBBS, establishment of another link in your network, a new and innovative use of packet radio, or even a somewhat mundane public-service application are all items worth telling the rest of the packeteers about. Or you might want to concentrate on a particularly burning issue or problem that you think would be significant to other sites.

We want to be able to turn out PSR on a regular basis without having to spend all our evenings and weekends doing so. So, a "ready-to-print" article sent to us via DRNET or a diskette mailer (MS-DOS 5-1/4" DSDD) would be greatly appreciated. Just set up Wordstar to use 50 character lines, with right-justification OFF (yes, OFF, in case we have to reform the paragraph, for it is a lot of trouble to take out those extra "hard" spaces).

We need volunteers! Please don't assume someone else will do it. Bring this subject up among your local group and "appoint" someone, if you have to! I have yet to get any details about EASTNET and WESTNET from anyone, despite my offer to compile a nationwide linking map. I can only assume that each of the multitude of users on both coasts thought someone else would take care of it.

How big is a region? Well, in most areas, the state boundaries will serve very well. In the larger states such as Texas and California, there will probably be further subdivisions, while the cluster of packeteers on the east coast may prefer to be considered a single entity. I'll let you figure out an agreement that is suitable for all the people concerned.

Our next issue should come out around the first of March. That means that there will be some portions about the annual meeting, some technical discussions (see our next message), and the rest is up to you. I hope you will take a few minutes to consider our request.

Paul Barnett, N0CRN, PSR Editor.

[FADCA should have an official correspondant to the TAPR PSR. Who will volunteer? Please contact me if you are interested. FADCA Ed.]

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M 11324 ANDY FREEBORN (N0CCZ,2983) 2/14/85
KEYS:/MAIL CALL/

Several packet radio enthusiasts needed to respond to queries from other packet radio enthusiasts. You can "read the mail" in a guaranteed QRM free environment. Compensation not negotiable but will be presently recognized amateur radio standards.

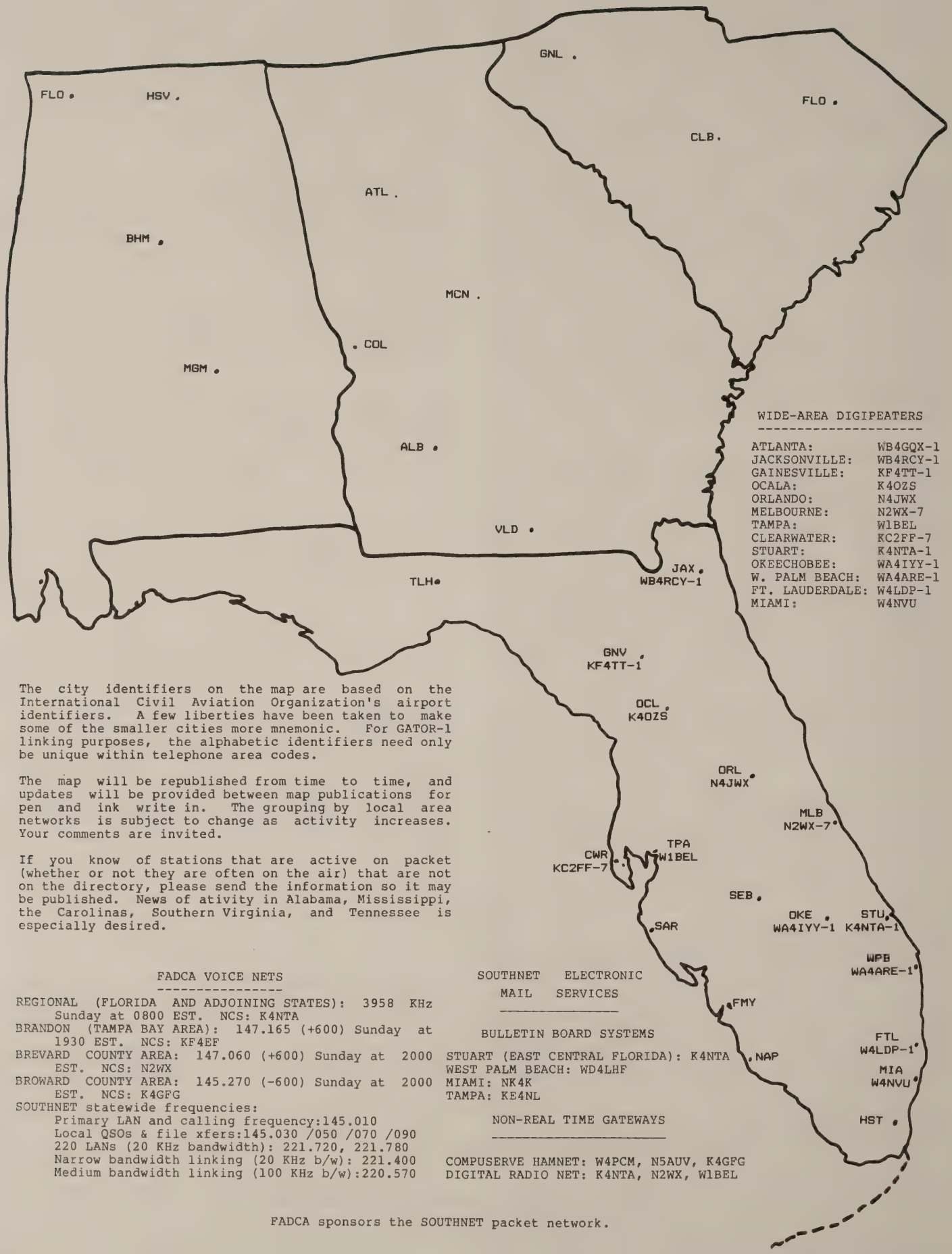
Karen, the TAPR office manager receives many written technical queries concerning packet radio. She is not only unable to answer the various queries, in most cases she doesn't understand the question. Even if she understood the question she doesn't know who is best suited to answer it.

Since the Tucson guys are already having enough "fun" we decided to share the joy. Karen will package the letters and send them to me. I will, in turn, forward them to others for the necessary response based on the nature of the query.

You will receive the letter, stationery, and a stamped envelope for the response. Handwritten replies are certainly acceptable.

Please give me your desired mailing address and your area of interest for responses, eg. radio interfacing, modems, digipeaters, RF, software, BBS's, kit assembly, linking, perfumed letters-any topic, etc. etc.

SOUTHNET



WIDE-AREA DIGIPEATERS

ATLANTA:	WB4GQX-1
JACKSONVILLE:	WB4RCY-1
GAINESVILLE:	KF4TT-1
OCALA:	K4OZS
ORLANDO:	N4JWX
MELBOURNE:	N2WX-7
TAMPA:	W1BEL
CLEARWATER:	KC2FF-7
STUART:	K4NTA-1
OKEECHOBEE:	WA4IYY-1
W. PALM BEACH:	WA4ARE-1
FT. LAUDERDALE:	W4LDP-1
MIAMI:	W4NVU

The city identifiers on the map are based on the International Civil Aviation Organization's airport identifiers. A few liberties have been taken to make some of the smaller cities more mnemonic. For GATOR-1 linking purposes, the alphabetic identifiers need only be unique within telephone area codes.

The map will be republished from time to time, and updates will be provided between map publications for pen and ink write in. The grouping by local area networks is subject to change as activity increases. Your comments are invited.

If you know of stations that are active on packet (whether or not they are often on the air) that are not on the directory, please send the information so it may be published. News of ativity in Alabama, Mississippi, the Carolinas, Southern Virginia, and Tennessee is especially desired.

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 0800 EST. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 1930 EST. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 2000 EST. NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 2000 EST. NCS: K4GFG
SOUTHNET statewide frequencies:
Primary LAN and calling frequency:145.010
Local QSOs & file xfers:145.030 /050 /070 /090
220 LANs (20 KHz bandwidth): 221.720, 221.780
Narrow bandwidth linking (20 KHz b/w): 221.400
Medium bandwidth linking (100 KHz b/w):220.570

SOUTHNET ELECTRONIC MAIL SERVICES

BULLETIN BOARD SYSTEMS

STUART (EAST CENTRAL FLORIDA): K4NTA
WEST PALM BEACH: WD4LHF
MIAMI: NK4K
TAMPA: KE4NL

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM, N5AUV, K4GFG
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL

FADCA sponsors the SOUTHNET packet network.

FT LAUDERDALE LAN
W4LDP-1 DIGIPEATER

K4GFG	TOM	DAVIE
N4KBA	PHIL	PLANTATION
W4LDP	KEITH	FT LAUDERDALE
W4SS	MANNY	LAKE WORTH
WA1JOU	RON	FT LAUDERDALE
WB4EGH	DICK	PEMBROKE PINES
WB4MMP	BRIAN	PLANTATION
WB4TUR	RALPH	DAVIE
WD0EEL	JIM	BOCA RATON

FORT MEYERS AREA LAN

WB1CYR	SEL	PORT CHARLOTTE

GAINESVILLE AREA LAN
KF4TT-1 DIGIPEATER

K4OZS	LARRY	OCALA
KF4TT	SCOTT	GAINESVILLE
W4DFU	G.A.R.C.	GAINESVILLE
WA4NWO	JOE	GAINESVILLE
WB4EXN	BILL	OCALA
WB4JCM	BOB	GAINESVILLE
WD4PQN	AL	OCALA

JACKSONVILLE AREA LAN
WB4RCY-1 DIGIPEATOR

KB4B	JACK	JACKSONVILLE
W4PCM	DICK	JACKSONVILLE
WB4RCY	DON	JACKSONVILLE
WD4ASW	BARRY	JACKSONVILLE
WD4BIW	BOB	JACKSONVILLE

MELBOURNE AREA LAN
N2WX-7 DIGIPEATER

AC7N	PASCAL	MELBOURNE
K3AAX	DAVE	MELBOURNE
K4ZS	FRED	TITUSVILLE
KB4IU	JACK	SATELLITE BCH
KE4IY	GARY	CAPE CANAVERAL
KF4WJ	JIM	MELBOURNE
N2WX	HOWIE	PALM BAY
N4BE	JIM	MELBOURNE
N4DNW	BILL	PALM BAY
N5AUV	GEORGE	PALM BAY
N6DLW	RON	PALM BAY
N4GEB	BOB	MELBOURNE
WB4ZXS	JOHN	COCOA

MIAMI AREA LAN
W4NVU DIGIPEATER

K4CAG	CARLOS	HOMESTEAD
KB4ES	PAUL	MIAMI
KC4DE	LEO	MIAMI
KI4T	JOEL	MIAMI
NJ4S	FRANK	MIAMI
NK4K	BILL	MIAMI
NX4L	STEVE	MIAMI
W4NVU	DADE EOC	MIAMI
WD4JKM	BILL	MIAMI
WD4MBL	RENE	MIAMI
WD4SFG	JOHN	MIAMI

ORLANDO AREA LAN
N4JWX DIGIPEATER

K1CYG	STANLEY	ORLANDO
K4PUT	LARRY	ORLANDO
K4AHO	JIM	ORLANDO
K4YBB	JIM	OKAHUMPKA
KF4WM	JACK	WINTER PARK
N4BLD	BOB	ORLANDO
N4JWX	DAVE	ORLANDO
N4IPX	STUART	ORLANDO
VE3LU	CLAYT	KISSIMMEE
W0RAO	ED	CASSELBERRY
WA4GIF	BUTCH	CITRA
WB4OAR	MARTY	ORLANDO
WB4TRJ	ARNOLD	ORLANDO
WD4BMN	LARRY	ALTAMONTE SPRGS

SEBRING AREA LAN
WA4IYY-1 DIGIPEATER

KE4PM	LARRY	AVON PARK
N4APC	BOB	SEBRING
WA4IYY	CHARLIE	OKEECHOBEE

STUART AREA LAN
K4NTA-1 DIGIPEATER

K4NTA	TED	STUART
KA4LIF	TOM	STUART
KA4VWW	GUY	STUART
KB4HJM	GEORGE	FT PIERCE
KF4I	LARRY	JENSEN BCH
KI4IB	EL	VERO BCH
W2KGV	LADD	PORT ST LUCIE
WA5RCX	DICK	FT PIERCE
WD4BRF	GEORGE	STUART
WD4BRG	NANCY	STUART
WD4KAV	JOE	STUART

TAMPA BAY AREA LAN
KC2FF-7 DIGIPEATER
W1BEL DIGIPEATER (Link to N2WX-7)

K4HFL	ART	NEW PORT RICHEY
K4OQ	BOB	CLEARWATER
K4RHD	BILL	SEMINOLE
K6TCS	FRANK	LARGO
KA4WNZ	ART	TAMPA
KB4LLO	DON	BRADENTON
KB4ZS	BILL	SEFFNER
KC2FF	ANDY	CLEARWATER
KC4WV	DAN	SEMINOLE
KE4NL	BILL	SARASOTA
KF4EF	PAT	TAMPA
KF4LG	BILL	BRANDON
KK4S	RAY	SARASOTA
N4AIY	STEVE	BRANDON
N4DST	JERRY	ST. PETE
N4HWW	DAVE	ST. PETE
N4KPU	HOWARD	WIMAUMA
N4ZQ	KEITH	SEFFNER
VE3ILW	LYMAN	TAMPA
W1BEL	GWYN	BRANDON
W4ABV	BILL	APOLLO BCH
W4APV	JIM	ST. PETE
W4DPH	JIM	CLEARWATER
W4ORA	JIM	TAMPA
W4SF	JOHN	CLEARWATER
W9DVM	PHIL	TAMPA
WA3QFN	NEIL	CLEARWATER
WA4FIB	JACK	INDIAN ROCKS BCH
WA4LLU	GLENN	TAMPA
WB3LGB	JOE	ST.PETE
WB4NCH	ANDA	TAMPA
WB8ZPE	BRAD	BRANDON
WD4IXI	BILL	ST. PETE

WEST PALM BEACH LAN
WA4ARE-1 DIGIPEATER

K4CAJ	CECIL	LAKE PARK
KA4EPS	LU	W. PALM BCH
KA4NOF	PHIL	W. PALM BCH
KA4UTK		W. PALM BCH
KA6ADB	MARTIN	BOYNTON BCH
KE4VR	BOB	LAKE PARK
W1SL	TOM	LAKE WORTH
W4PHL	PB EOC	W. PALM BCH
W4UZJ	LLOYD	RIVIERA BCH
WA4HXZ	HENRY	W. PALM BCH
WB4KGY	DOUG	W. PALM BCH
WD4LHF	JIM	W. PALM BCH

North Georgia stations
WB4GQX-1 Digipeater (145.01) Gainesville
KD4NC-1 Digipeater (13/73) Marietta

K4IHP	JOE	SANDY SPRINGS
K4OAH	GAREY	DULUTH
KA4OVX	CHRIS	(via N4CI)
KC4AU	BILL	CONYERS
KC4ZU	MICKEY	DULUTH
KD4NC	DOUG	MARIETTA
KF4JJ	JOHN	CONYERS
KF4XN	MIZELL	WHITE
KI4PD	JIM	GAINESVILLE
KI4XO	JOHN	MARIETTA
N4BGL	JOHN	SNELVILLE
N4CI	ERIC	CONYERS
W4EAW	BOB	CUMMING
W6OTE	AL	ROSWELL
WA4DHD	JIM	GRIFFIN
WA4MEI	RANDY	REX
WA4MIZ	AL	ATLANTA
WA7RZW	JON	STONE MOUNTAIN
WB2CPV	BILL	NORCROSS
WB4BYK	JOHN	CUMMING
WB4DSD	KAY	(v WB4GQX)
WB4GQX	DENNIS	CUMMING
WB4HYY	JIM	ATLANTA
WB4PTT	BASIL	KENNESAW
WB4PYL	DAN	MARIETTA
WD4KDT	HARVEY	STONE MOUNTAIN

South Georgia Stations

K4XA		ALBANY
K8UTY		ALBANY
KA4DPF	BOBBY	TIFTIN
KB4JF	CURTISS	NASHVILLE
KF4JF	LARRY	HAHIRA
WB4ZNW	GLEN	MOULTRIE
WD4LYV	WAYNE	SYCAMORE
WD4MNT	BOB	CORDELLE

WATCH FOR GATOR-1

SQUELCH TALES

BY N4ZQ

Time! There is nothing more exasperating than to have to wait a long period of "time" to get a program loaded in from a Commodore disk drive. Of course this problem is relative to a computer user only. I mean, how many other people would be concerned about the difference between 70 seconds and 168? As Jimmy Buffett says "life is short, maybe 24 hours, 60 good years, it's really not that long a stay". Is one or two minutes going to make that much difference? Doubtful, but computer hackers understand that the wait is relative and we all want to get on with the show. This thought came to mind as I waited what seemed like an eternity for VIP TERMINAL to load up; 168 seconds to be exact! I mention this in reference to Eric's (N4CI) article in the November/December BEACON on the VIP program. Eric claims it is worth the wait. I question if it is. I will agree that it is the most complete terminal program I've seen for the C 64. But have you ever tried to read an 80 or 106 character line on a TV monitor? It's on-screen clock is nice, but the last thing I need is another time piece to set. I say this because I just got finished resetting all the clocks in the QTH after another infamous Tampa Electric Company power outage. But probably the biggest drawback is the 8K buffer. Not really very large when you get into program and file transfers. I would think the price of $59.95 alone would be enough to scare the causal modem user away. Why pay for all the overkill that VIP has included, when it's not needed. Sorry Eric, but my favorite, which I use 99% of the time, is COMPUSERVE VIDTEX. It's probably not as pretty to look at, but it gets the job done. With its 28K buffer I've never run it over with anything I've downloaded yet. And the biggest plus is it doesn't take all that TIME to load in.

As I compose this the weekend after the big Miami Hamfest, a lot of good news has come forth. Look for some new blood on the air, as 9 kits were sold at the show. No GLBs were on hand, or there might have been more to listen for. Seems that Heathkit took the wraps off their rumored (last months BEACON) packet kit. Surprise, surprise. It's a TAPR Board in a Heathkit box. Oh well, there's still hope for further software approaches by others. I guess that comes from the thinking that what ever can be done with hardware, can be done to some extent with software. Look for the availability of the HEATHKIT around April, at a cost of about $300.00 (kit form, with cabinet).

Great news for the west central coast packeteers. Thanks to the efforts of Andy (KC2FF), Bob (K4OQ), and Dave (N4HWW), Clearwater now has its digipeater running. Up 230 feet on top of a condo, running about 100 watts to a 4 Bay array pointed east, it should get guite a workout. Bob supplied the TAPR kit TNC, Andy secured the RF hardware and N4HWW the site. The TAPR soon to replaced with an 820 board in the near future. Great going guys! Now the talk is for the Tampa LAN to get their own BBS going... To finish up the other Digipeater updates, Ft. Lauderdale's W4LDP-1 at 350 feet has been operational since the 27th of January. Just in time for the Miami show.

Speaking of 820s, the Tampa packet pack had a get-together last evening (2/8) at the HoJo's in Clearwater. The meeting was attended by 11, most of whom had made arrangements to get an 820. After 2 gallons of coffee and treats and a 2 hour meeting explaining the 4 uses of the 820 and the dispensing of paperwork, all retired to the cold parking lot to pick up the hardware. Six boards were passed out by W1BEL, so look for a lot of 820 talk in the coming weeks as all work on getting their systems up and running.

Haven't heard to much from our SOUTHNET neighbors, but understand a Georgia statewide packet meeting was to take place this weekend in Macon. Will anxiously await word to see what great things are being planned. A few years ago, I had a great time at the Atlanta Hamfest, and was thinking that maybe it was time for a repeat trip. Great show, good location, and just a lot of fun. Usually in the later part of June, when the kids are out of school, we make a vacation of it. From the Hamfest, we take off to the Smokey Mountains, and just have a ball in some of the prettiest country east of the Rockies. If any packet forums are on tap for the show, I'll start making my plans now... Word has it that WB4ZNW in Moultrie is running a BBS. Anyone from FADCA had a connect with it yet?

A number of small Hamfests are taking place this month around the state. Stuart on the 16th, Ft. Meyers the following weekend, with the Hernando County a week before the big Orlando show. Look for some FADCA participation at all of them. The Orlando show promises to offer the biggest packet activity. Make your plans early, as Forums are being planned for not only selling Packet to the newcomer, but to have something for those of us that have been in the business for awhile. Also understand that a Director's meeting is planned. The latest information that we have is that the membership seminar will take place at 3 PM Saturday, with the FADCA booth operational both days of the show.

Time or space does not permit me to run a few C64 tips by this month. I question also if there are that many 64 owners out there, that would make it worth while. It seems that most of us out there are running all sorts of computer terminals, with no particular one in dominance. That is one plus for all the 820 work taking place. In time there will be a common ground for these people, and they can get on with program and file transfers. Which is what I think packet is really designed for. However, if the need is there, we will be happy to include a few tips for 64 owners from time to time. One good tip, and will try to include next month if the need is there, is to be able to run two Commodore computers off one disk drive!

Look foward to seeing a good bunch of you in Orlando on March 9th and 10th. Happy connects to all.

$49... Keith

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

HOW TO BUILD A GATOR 1 LINKING NODE

The time is drawing near when GATOR 1 will be a reality. GATOR 1 will provide high speed relaying of packets between two meter 1200 baud digpeaters on 220 mHz at 9600 buad. This eight times transmission speed increase along with the moving of some digipeaters off of 145.01 will greatly increase the throughput of the network. Please refer to my article on GATOR 1 else where in this issue of the FADCA>BEACON.

In this article I will cover what it takes to build a GATOR 1 LINK station. Please refer to figure 1. The major components are:

1) Two meter transceiver
2) 1200 baud modem
3) 220 MHz transceiver
4) Parts to modify xcvr for 9600 baud FSK
5) FAD Board
6) Xerox 820 computer
7) Two meter and 220 mHz antennas
8) Power Supply

1). Two meter transceiver - These GATOR 1 stations will for the most part be located where there are now two meter digipeaters. The two meter transceiver that is now used will become the GATOR 1 link into two meters and function just as it does now for two meter to two meter digipeating. The existing TNC if it is not already an 820 will not be needed as you will see later.

2). 1200 Baud modem - As we are not using the regular TNC, we do not have a 1200 baud modem. Jerry, N4AJX has designed a very good 1200 baud modem using the XR2211 and 2206 chips that will be available shortly through FADCA as a bare board. You could use any Bell 202 type modem.

3). 220 mHz. transceiver - Steve Goode in Ill. has designed a modification for the Hamtronics FM-5 220 MHz. 10 watt crystal controlled tranceiver kit to permit it to run 9600 buad frequency shift keying (FSK). Tom, K4GFG, is testing the modification and should have word soon on its performance. Indications from Steve are that it is very good.

4). FM-5 Modifications - This is the parts and circuit changes that are required for the FM-5. Lyle Johnson of TAPR says that as soon as he has the details they plan to offer a kit of all that is needed.

5). FAD Board - Much has been said about the FAD board since Howie N2WX designed it last summer. The heart of the FAD Board is the Zilog Z-8530A serial communications controller. This is a two port device that will be configured to operate one port at 1200 baud on two meters and the other at 9600 on 220. It plugs into a

modified Xerox 820 computer board. TAPR has these bare boards available now. The Z-8520A can be obtained from Larry, K4OZS in Ocala. [FADCA is working on a substantial quantity discount. -ed.]

6). Xerox 820 - The 820 is the brains for the station. Howie designed the modification to the 820 for the FAD board and is working on the GATOR 1 software. I worked out the modification to permit the use of the 2764 Eprom that holds the program. The 820 functions as a dedicated computer and does not require keyboard, video monitor or disk drive. It handles both the normal two meter digipeater function as well as links into the high speed network.

7). Antennas - Lets assume that the site already has a two meter antenna. The 220 MHz. antenna might be omni-directional on a short path, but will probably require one or more high gain beams. The GATOR 1 220 mHz station will need to talk with only 1, 2, or 3 other GATOR 1 stations so the antennas will have to be selected to provide solid connections with these stations.

8). Power Supply - Here in Florida we should always keep in mind the desire to provide emergency communications. For this reason I recommend that the complete station be run from a battery with a charger. Most two meter transceivers run from 12 volts, the Hamtronics FM-5 is 12 volts and the 820 can be made to run from 12 volts as well. A group of Colorado packeteers have modified the Radio Shack 277-1016 switching power supply to operate from 12 volts DC and provide all the needed voltages to operate the 820. Some of the details of the modification appear in this BEACON. At the worst case, two of these supplies could be used to power the 820, but I think that one will do the job.

Figure 2 is a suggested bill of materials with approximate prices.

As you can see the total cost to put up a GATOR 1 station is about $500.00 assuming there is an existing two meter transceiver at the site. If there are some well supplied junk boxes in your group, the cost will be less. Now is the time for local groups to start planning for GATOR 1. Think about forming a local chapter of FADCA. You might consider approaching the local county CD, Red Cross, ham club or a local industry for support. A well formulated presentation to these groups describing the emergency communications capibilities of the GATOR 1 system might go a long way to getting your area on line.

BILL OF MATERIALS

PART	SOURCE	APPROX COST
1200 Baud Modem	FADCA/N4AJX	$ 9.00
RM5 220 Xceiver	Hamtronics	175.00
FSK mods kit	TAPR	25.00(?)
FAD Board	TAPR	27.50
Xerox 820	Xerox	50.00
Power Supply	Radio Shack	5.00
Zilog Z-8530A	K4OZS	24.00
Car Battery	-	40.00
Battery Charger	-	40.00
220 Antenna	-	50.00
Misc. Chips	-	30.00
Cable & Hardware	-	20.00
		$495.50

FIGURE 2

THE PACKET / COMMODORE - 64 CONNECTION
N4CI - ERIC

Still not having gotten over the shock of getting a Macintosh for Christmas, I have not done much on packet with the C-64 in the last few months. Chris and I, however, have managed to interface the Mac to the TAPR TNC and it works great. Sure do like the 80 columns, HI..

I have had no response or requests foar the Superbase-64 packet users database programs. I will be glad to send them to anyone who wants them for an SASE and a 5 inch disk. The C-64 is a very common computer and makes a good choice for keeping club records since on change of administration it is very likely that another C-64 can be found to keep the records. The nice thing about Superbase 64, is that it has an export command whcih will allow the transfer of records with any tyhpe of delimiter. If you have a favorite DB program for the Apple or IBM, Superbase files can be exported to your format over packet or the telephone with the proper delimiters between fields.

If you have the time, I would appreciate a note if you are using the C-64 on packet and any uses or programs you have found useful for packet. (That goes for the Vic-20 also.) If I can compile some comments I will type them up and get them into the BEACON. We have not really done any experiments with file trnsfers but that is coming soon. I have a very simnple BASIC program to transfer programs between two C-64s which has block checking and writes programs directly to disk. It is available for the asking. We are also looking at another transfer protocol which should work well on packet.

C-64 HINTS AND KINKS

HEAT SINKING--I have left my C-64 on for as long as 2 weeks at a time and I have had two bite the dust due to excessive heat build up. The new C-64s are coming through with heat sinks on the LSI chips. If you are using an older C-64 at or near 100% duty cycle, I would advise you to heat sink the 40 pin LSI chips with commonly found heat sinks and epoxy. It was easy to pop out heat damaged I/O chips in the VIC-20, but the C-64 has custom (not readily available) I/O chips and processor. I also wonder about the metal covered cardboard RFI 'shielding." It really confines the heat. The C-64 is relatively 'quiet' and may do better without the flashing. This is also advisable for the chips in the disk drive. The problems you are experiencing with the 1541 disk drive are undoubtedly due to heat (or careful factory guesswork on alignment.) As far as the drive is concerned, a little room air purifier fan over the vent cures almost all of the overheating problems. NOTE: Make sure you check for clearance around the heat sinks before final installation.

PRODUCTS OF CHOICE

HARDWARE: "FAST LOAD" by Epyx. This is a cartridge which plugs into the expansion port on the back of the C-64. If you do a lot of disk manipulation it is well worth the money. The device speeds up loads and saves by up to 4 times, and has a built in wedge. It supports single keystroke directory ($); simple disk copy program; single keystroke autoboot of the first program; sengle keystroke reading of error channel and all disk commands with @ and no quotes. Just the savings in the humber of times you have to type "load "$",8" is worth it. You can disable the dartridge with the 'Pound Symbol' key. It may not work with all programs so be careful when you test it on your database files. Works with protetcted disks.

SOFTWARE: "FLEXIDRAW" by Inkwell Systems. This light pen and software system is by far the best (highest resolution) system for the C-64. Included in the package is the light pen, and a software disk which contains pictures and programs. The programs include Flexidraw (supports the light pen), Telecommunications package to send high resolution drawings over packet (or telephone), overlays for music and electronics graphics symbols, coloring program, sprite maker/animator, and many others. I have also created common pinout blocks for IC sockdts in horizontal and vertical aspects. The system is more convenient to use than a graphics tablet and better than other light pen systems. There are 2 pages available so that you can keep symbols to be copied on one page and the drawing on the other. With this program it would be possible to design actual printed circut diagrams with enough quality for photoetching and also be able to transfer these diagrams over the air via packet to another system using a C-64 with Flexidraw. Unfortunately you cannot display pictures downloaded from Compuserve or created with other graphics programs. Flexidraw sells for about $124.

Well, that is it for this month. Will try to have something more packet specific in the next issue. Let me hear some ideas for the C-64 or Vic 20. There is a cry up here for a split screen terminal program for use with the GLB TNC. Any comments, suggestions, hints, requests, etc will be considered. de N4CI.

PACKET LINKING WITH GATOR 1

Ted Huf, K4NTA

The day to day operation of packet radio now involves using digital repeaters or digipeaters as they have come to be known. For those who might be new to this mode of communications, a digipeater is much like a voice repeater except that it operates on a simplex frequency (as does most packet radio operation). A digipeater listens and temporarily stores all frames in memory. When there is a frame that contains instructions for the digipeater to repeat it, the digipeater waits for a clear frequency and retransmits it.

The packet protocol that we are using (AX.25) currently allows 8 digipeaters to be used to relay a frame. For example, a command to make a connection to a station might look like this: CONNECT WD4BIW VIA W4NVU, W4LDP-1, WA4ARE-1, K4NTA-1, N2WX-7, WB4RCY-1. Just to give you an idea of the distances covered, W4NVU is in Miami and WB4RCY-1 is in Jacksonville. This type of connection will work fairly well if all of the digipeaters can hear each other well and there is no QRM. The QRM factor is very important for these long connections to work. With AX.25 there are no acknowledgements exchanged between the various digipeaters so that the station sending a packet does not know if it got through until the acknowledgement for the receiving station gets repeated all the way back down the line. If the acknowledgement frame has a collision on the way back, the transmitting station will resend the packet even though it was received at destination.

All of these retries cause more activity on the channel and makes communications difficult. If there was no one else on the frequency, long contacts would be no problem.

An improvement to the digipeating protocol is planned to permit acknowledgements between digipeaters so that the acknowledgement will not have to travel all the way back through the line of digipeaters. One problem that is seen with Level 3 though is that it is all still on the same frequency. There will still be collisions along the line and retries will be required, but the loading of the channel will be less.

Here is where linking comes in. Lasat year I proposed to FADCA a linking system called GATOR 1 that would permit linking using existing AX.25 level 2 protocol and Terminal Node Controllers. Plans are now underway in Florida to implement this system on 220 MHz. A typical network controller will consist of 220 and 145 MHz transceivers and a network controller. The controller will be a Xerox 820 single board computer with software written by Howie Goldstein, N2WX. The HDLC will be generated by a Zilog Z8530-A SCC chip in a circuit also designed by Howie (the FAD board). The FAD board is a two port device; one port will be running at 9600 baud on 220 MHz and the other on 145 MHz at 1200 baud using the AX.25 Level 2 protocol.

With this plan, each city would be on a different two meter frequency with about 75 miles separation between co-channel stations. The State of Florida can be covered in this fashion using the frequencies between 145.00 and 145.10 MHz. This would help alleviate the interference that hampers todays operations with one frequency of 145.01 MHz.

The two meter side of the digipeater would work just like today's digipeaters, using a callsign like K4NTA-1 for example. If a station wished to use K4NTA-1 as a two meter to two meter digipeater, the same syntax as is used now would be used. To access the high speed network a different identification would be used.

Each station on the high speed network would be known not by call letters, but rather by its telephone area code and the abbreviation of the city name. For example: Stuart would be 305STU, Miami would be 305MIA and Jacksonville would be 904JAX. The use of area code + city will make it much easier for the network controller computer to route the packet to the correct city, and for users to remember the identifications.

Here is how a typical connection from Miami to Jacksonville might go. CONNECT WD4BIW VIA 305MIA, 904JAX. (With our existing system, it would be CONNECT WD4BIW VIA W4NVU, W4LDP-1, WA4ARE-1, K4NTA-1, N2WX-7, WB4RCY-1). Here is what happens. The network controller at Miami is W4NVU for normal two meter digipeating, but it is also 305MIA for the link into the high speed network. When Miami hears a packet with 305MIA in the digipeater list, it reads in the packet and queues it up for transmission along the high speed network. Before the transmission is made though, it must check to see where the packet it supposed to go. In each network controller there is a table that lists all of the other high speed link stations in its own area code. In this case, Miami will have a route table to all points in the 305 area code. It will also have a table that tells it what to do with packets for other area codes. In our example, Miami does not have to know how to get to Jacksonville, only how to get to a link stations that handles packets for area 904.

To follow the progress of this connect request going to Jacksonville, Miami looks up 904 and finds out that all 904 packets go to 305FTL. Ft. Lauderdale does the same and passes it on to 305WPB. West Palm Beach does not handle 904 but knows to pass it on the 305STU. Stuart does the same and relays it to 305MLB. Melbourne does handle 904, so it has both the 904 and 305 routes and knows to send the packet on to 904DAY in Daytona which forwards it to 904JAX.

Each high speed link station controller would disasemble these frames and place them in a queue for transmission. For example, Miami might send only the connect request on to Ft. Lauderdale, but Ft. Lauderdale might add on a normal transmission going to Tampa (813TPA) to the frame before sending it to W. Palm Beach. W. Palm Beach might add an acknowledgement going to Stuart. Lets assume Stuart has a connection with the Tampa link station, so Stuart would remove the packet going to Tampa before it sent the rest on to Melbourne. It would then place the Tampa packet in a queue for transmission to Tampa on the GATOR 1 network, and send the Stuart packet out on the two meter frequency.

When a packet sent along the high speed network reaches its destination city, Jacksonville in our example, 904JAX would transmit it on the two meter transmitter. If WD4BIW's TNC heard the frame, it would automatically send the acknowledgement of the connect request back along the same route to originating station.

Each station on the high speed network has a permanent connection with at least three of its neighbors. The GATOR 1 protocol will handle acknowledgements within the network but will not support a connection to an AX.25 Level 2 station. It only acts as a relaying station so acknowledgements between AX.25 Level 2 stations must be relayed along the network.

Unconnected frames like those sent with the command UNPROTO CQ VIA 305MIA, 404ATL would be permitted. This would permit a station to direct a CQ to a particular city. Another feature of this system would be helpful for the the packet operator who could not access a high speed link station directly. A connection like CONNECT KA4DPF VIA W4XYZ, 305MIA, 904JAX, WD4LVY would do a two meter digipeat via W4XZY to get to 305MIA and also a digipeat via WD4LVY after it was transmitted by the Jacksonville link station.

With this type of high speed network, the relaying of packets would be transparent to the user. He would not have to know how to get a packet to say Atlanta, only that Atlanta was 404ATL. While it is transparent to him, he also has no control over what route is used. I think this drawback is overcome by the fact that existing equipment can be used without modification.

My thanks to Howie, N2WX, for designing the interlink protocol and all of his work on the Xerox 820 and FAD boards. A description of the GATOR 1 inter link protocol may be found in the June 1984 FADCA>BEACON.

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12 VDC POWER SUPPLY FOR TNC BOARDS

Packeteers in Colorado have adapted a surplus power supply (RS 277-1016 or BNF Enterprises 4NS0427) to provide the +/- 12 VDC required by the TAPR and VADCG TNCs to allow operation from a 12 volt battery. Some changes to the TAPR boards are required to ensure compatibility with the new supply. VADCG boards require no modification. Please note that these modifications, IF NOT FOLLOWED CLOSELY could result in the destruction of some of the solid state devices on your TNC. CAREFULLY follow the instructions EXACTLY!. Perform the modifications in thefollowing order:

POWER SUPPLY MODIFICATIONS

1. Read this procedure, understand it, then do the job CAREFULLY.
2. Test the supply with dummy load resisters BEFORE attaching it to your TNC.
3. Use a fuse on the input lead.

CONVERTING -5V OUTPUT TO -12V

1. Remove C14 (1000 uF, 10V) and replace with a capacitor rated 470uF, 16V (RS 272-957). Be sure to observe polarity. Ensure that the replacement capacitor is the same body diameter or it won't fit.
2. Remove R18 (30K, 2%) and replace with a series combination of 51K and 6.8K. Use 2% resistors if possible or you may have to change the 6.8K to get the exact resistance. This will be determined during TESTING. Note: the output is now rated at 50mA at -12V instead of 200mA at -5V.

REDUCTION OF INPUT VOLTAGE (Optional)

(Skip this section if you will use more than 15 volts input)

1. Replace R7 (240 ohm, 1 watt) with 120 ohm 1 watt.
2. Replace R19 (910 ohm) with 480 ohm.

BYPASS INPUT RECTIFIER (Optional)

NOT for use with AC input.

1. Connect a jumper from the "+" terminal of D1 to the terminal of D1 that connects to L2.
2. Connect a jumper from the "-" terminal of D1 to the terminal of D1 that connects to L1.
3. Ensure no shorts!
4. Check continuity from the input leads (SW1 on, no power applied):
   A. Red wire to D1 "+".
   B. White wire to D1 "-"

TAPR users should continue, VADCG users go directly to the TESTING section. The most recent TAPR TNC's have a modification in the oscillator to prevent parasitic operation of the clock oscillator. If you have a 7404 at U1, you have the new board. If not, perform the following:

1. Replace U1 (7414) with a 7404.
2. Connect a 4.7K resistor from pin 5 of U1 to pin 3 of U3.
3. R12 and R13 should be 1.0K - some early models have 1.5K.

TESTING

For initial testing, USE DUMMY LOAD RESISTORS INSTEAD OF YOUR TNC in case of malfunction.

Test Loads in ohms:

Output	VADCG	TAPR	Min Load
+5V	6.8, 5W	6.2, 5W	51, 1/2W
+12V	62, 3W	180, 1W	470, 1/2W
-12V	470, 1/2W	470, 1/2W	1K, 1/4W

Substitution of higher values (up to "Min Load" is acceptable. DO NOT test without any load at all.

1. Connect to a 12V source (18V if the reduced input step not performed).
   A. Watch POLARITY if modified for DC input. RED is "b+" and WHITE is "-".
   B. Don't forget the FUSE.
2. Turn on SW1
   A. Measure the +5V - adjust RV1 for 5.0V.
   B. Measure the +12V - it should be between +11.5V and +12.5V. There is no adjustment.
   C. Measure the -12V - it should be between -11.5V and -12.5V. To raise, increase the 6.8K (part of R18); to lower, decrease the 6.8K. Output will change .25V for every 1K change in the 6.8K resistor.

HOOK-UP

1. Use #24 wire or larger - keep it short as possible.
2. VADCG use regular power supply connections. - CHECK WIRING BEFORE POWER UP!
3. TAPR users - to preclude destruction of the 3-terminal regulators, they will be removed and the transformer hooked to the switching power supply. The TAPR board can then run on either 115VAC or 12VDC. You should have followed all options up to this point.
4. Remove U22, U23, and U24. (U24 may have been mounted on your cabinet back-panel)
5. Remove D9 and D12
6. Connect an insulated wire (#24 or larger) from the ANODE of D9 (unbanded) to the output of U22 (pin 3).
7. Connect an insulated wire (#24 or larger) from the cathode of D12 (banded) to the output of U22 (pin 3).
8. Disconnect the 3 wires from terminals 3, 4, and 5 of the power transformer.
9. Examine the power connector J4. If you had the +5 regulator mounted outboard there will be a wire at pin 7 (closest to C1). If you don't have a wire there, prepare one and install it at pin 7.
10. Connect the wire from pin 7 to the switching supply +5V output.
11. Connect the wire from pin 6 to the +12V output.
12. Connect the wire from pin 5 to the -12V output.
13. Connect the wire from pin 4 to the gound of the switching supply.
14. If you had the +5V regulator mounted outboard, remove pin 3 from J4.
15. Connect the RED input lead of the switching supply and the cathode (banded end) of a 1N4001 diode to the pin (or the last spare pin, if the regulator was on-board).
16. Put the pin back into pin 3 of J4.
17. Slide a piece of spaghetti over a piece of wire and solder one end to the anode of the 1N4001 diode. Slide the spaghetti over the diode for insulation.
18. Connect the other end of the wire to one side of a fuseholder.
19. Connect the other end of the fuseholder to a wire (positive DC input)20. The white lead from the switching supply is the negative DC input; splice additional wire if necessary.
21. Connect the input leads to the +12V supply.
22. Check with a VOM from switching supply outputs to the power traces in the wire wrap area. Check for shorts from +12V input to ground (resistance is normal, a SHORT is not. Check continuity for +12V input and ground, from input leads to the switching regulator card.

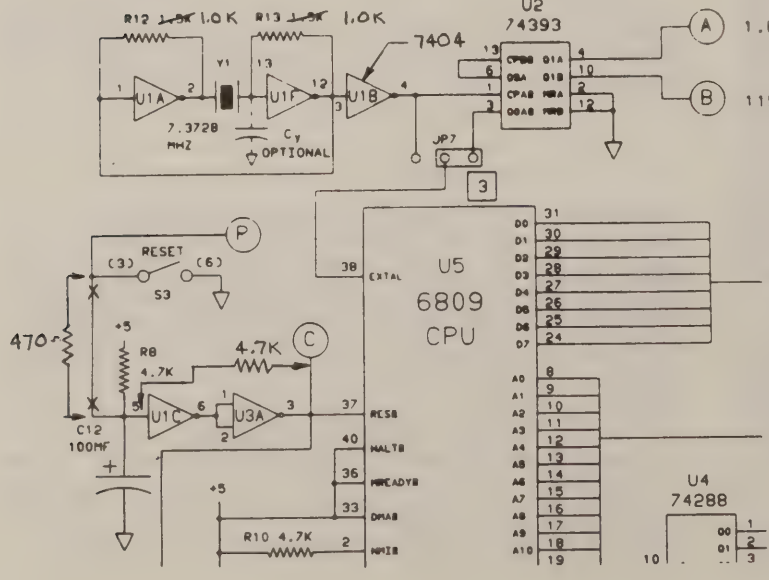
MOUNTING NOTES:

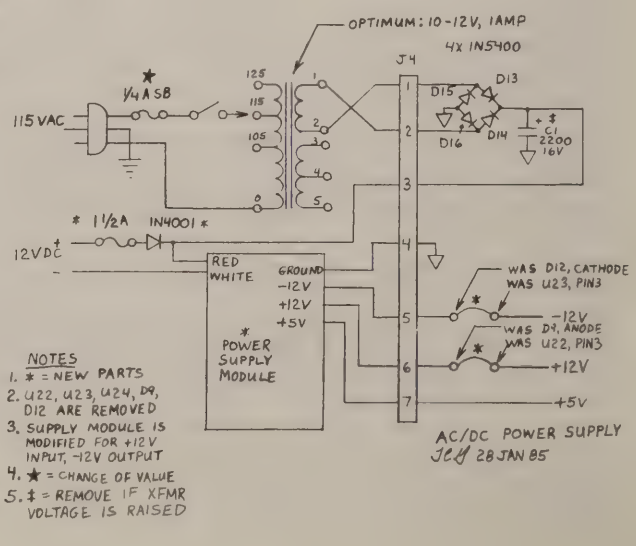
1. #6 hardware may be used at the holes near each corner.
2. Keep as far away from the modem as possible.
3. The mouting hole near SW1 must have insulating hardware to avoid shorting the power input to ground.

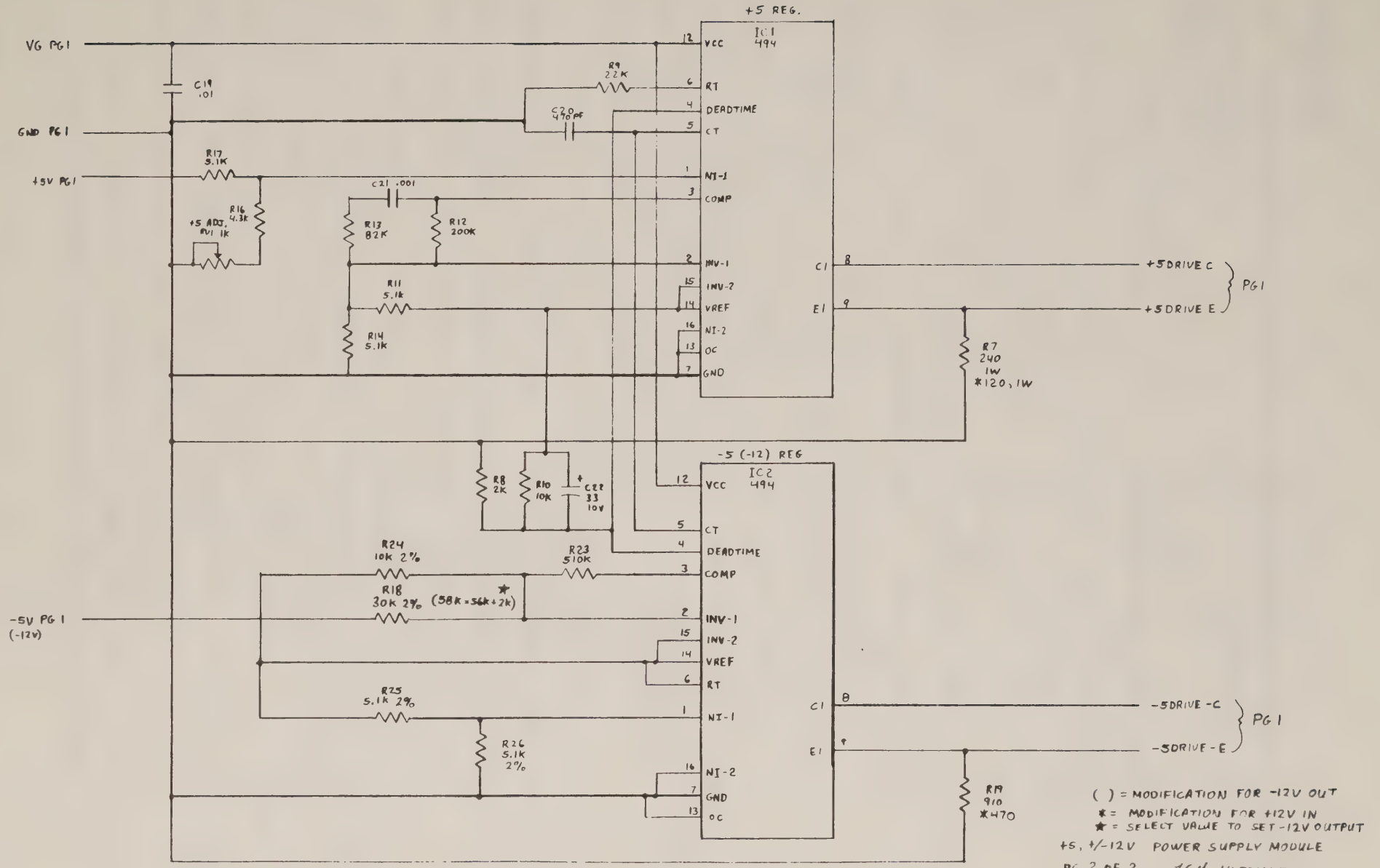
POWER UP

Power up the TNC by turning on SW1 on the switching supply. The log-on message or autobaud routine message should appear. Mesaure the +5V on the TNC and make small adjustments to RV1 if necessary. If you are usinga TAPR board with provision for both AC and DC, be sureit works on both AC and DC.

Article by Don Brown N0BRZ, Tim Groat KR0U, and Linc Haymaker K0ZCO. Condensed by KF4EF.



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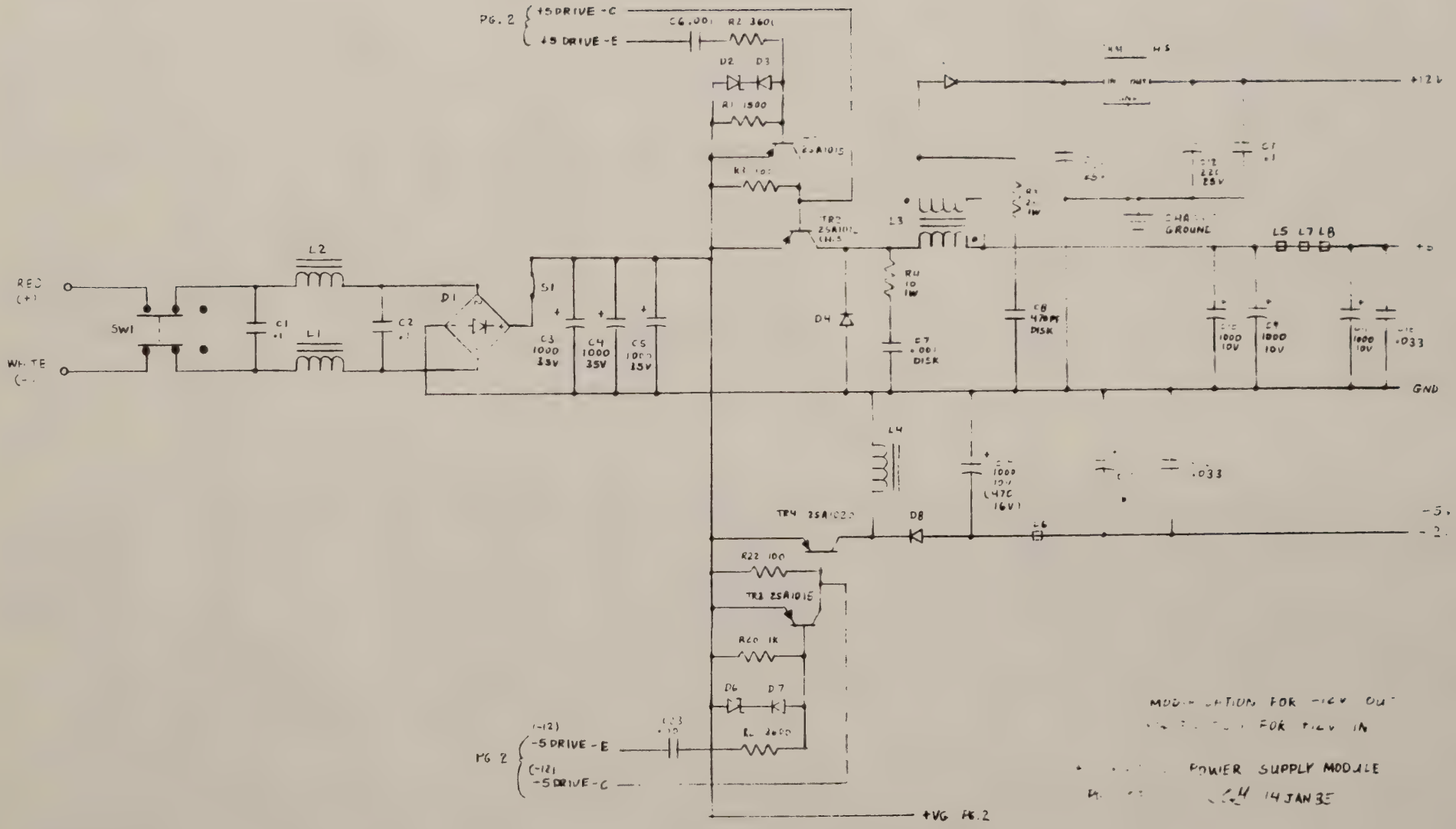
IC1
494
VG PG1
GND PG1
+5V PG1
C19
.01
R9
2.2K
C20
470pF
R17
5.1K
R16
4.3K
+5 ADJ,
RV1 1K
C21 .001
R13
82K
R12
200K
R11
5.1k
R14
5.1K
VCC
RT
DEADTIME
CT
NI-1
COMP
INV-1
INV-2
VREF
NI-2
OC
GND
C1
E1
+5DRIVE C
+5DRIVE E
PG1
R7
240
1W
*120, 1W
-5 (-12) REG
IC2
494
R8
2K
R10
10K
C22
33
10V
R24
10K 2%
R23
510K
R18
30K 2%
(58K = 56K + 2K)
-5V PG1
(-12V)
R25
5.1K 2%
R26
5.1K
2%
-5DRIVE-C
-5DRIVE-E
RR
910
*470
( ) = MODIFICATION FOR -12V OUT
* = MODIFICATION FOR +12V IN
★ = SELECT VALUE TO SET -12V OUTPUT
+5, +/-12V POWER SUPPLY MODULE
PG. 2 OF 2
JCH 14JAN85


PG. 2 +5 DRIVE -C
+5 DRIVE -E
C6 .001
R2 360
D2 D3
R1 1500
TR2 2SA1015
R3 10
L3
R21 2 1W
CHASSIS GROUND
L5 L7 L8
+12 V
+5 V
RED (+)
WHITE (-)
SW1
L2
L1
C1 .1
C2 .1
D1
S1
C3 1000 35V
C4 1000 35V
C5 1000 35V
R4 10 1W
D4
C8 470PF DISK
C7 .001 DISK
1000 10V
1000 10V
1000 10V
.033
GND
L4
1000 10V (470 16V)
.033
TR4 2SA1023
D8
L6
-5 V
-12 V
R22 100
TR3 2SA1015
R20 1K
D6 D7
PG 2 (-12) -5 DRIVE -E
(-12) -5 DRIVE -C
+VG PG. 2
MODIFICATION FOR -12V OUT
FOR +12V IN
POWER SUPPLY MODULE
14 JAN 3E

FADCA

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

812 Childers Loop
Brandon, FL 33511
(813) 689-3355

Sponsor of the **SOUTHNET** Packet Network

The Florida Amateur Digital Communications Association is an organization of people interested in digital communication techniques, such as packet radio. Since its founding in late 1983, FADCA has grown to be one of the major regional packet organizations in the nation. FADCA members are from all parts of Florida, Georgia, and numerous other states. Most are radio amateurs, but a license is not required for membership.

FADCA provides a structure for planning the orderly growth of packet radio networking. Our members have spread the word about packet activity by presenting demonstrations at most Fla. hamfests and at many radio and computer club meetings. Florida packet activity is very high on a per capita basis.

FADCA's newsletter, The FADCA BEACON, provides technical information and operating news to over 250 persons each month. FADCA has earned a favorable national reputation for its members by reporting their ideas and activities in the newsletter.

You should join FADCA if you are interested in computers, RTTY, AMTOR, packet, emergency communications, traffic handling, or just keeping up with the new digital frontier of amateur radio. Your membership will provide the support needed to allow FADCA to continue to promote packet radio, develop the SOUTHNET packet network, and represent the interests of our region.

Please complete the membership application on the reverse side.

A NON-PROFIT ORGANIZATION FOR RESEARCH, DEVELOPMENT, EDUCATION, AND PUBLIC SERVICE.

FADCA

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association (FADCA), 812 Childers Loop, Brandon, FL 33511. FADCA is a non-profit organization devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO
Ted Huf, K4NTA
Tom Kneisel, K4GFG
Bill Sams, KF4LG
Dave Frey, K3AAX
Dick Klein, W4PCM
Gwyn Reedy, W1BEL
Bill Whitaker, WD4JKM

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self addressed, stamped (37 cents) business size envelope to the FADCA address.To join, complete the membership application below and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

Send this completed form with your dues payment ($12.00) to:FADCA, 812 Childers Loop, Brandon, FL 33511.

NAME:_____CALLSIGN:_____ LICENSE CLASS:____

STREET ADDRESS:_____CITY AND STATE:_____ZIP:_____

TELEPHONE: (HOME):(_____)_____-_____ (WORK):(_____)_____-_____ ARE YOU ON: PACKET? AMTOR? RTTY?

TO WHAT OTHER AMATEUR ORGANIZATIONS DO YOU BELONG?_____

WHAT EQUIPMENT AND SOFTWARE DO YOU USE FOR DIGITAL COMMUNICATIONS?: PACKET TNC(S):_____

RTTY INTERFACE/TERMINAL UNIT(S):_____AMTOR:_____

RF GEAR:_____

COMPUTER(S)/TERMINAL(S):_____

DIGITAL INTERESTS (ELECTRONIC MAIL, BBS/MSO SYSTEMS, NETWORKING SOFTWARE, MODEM DESIGN, ...YOU NAME IT.):

_____

WHAT SKILL OR SERVICE CAN YOU OFFER IN SUPPORT OF FADCA?:_____

_____

COMMENTS/SUGGESTIONS/NAMES OF OTHER INTERESTED PERSONS:_____

NEW PRODUCTS

Hams visiting the FADCA booths at the Fort Lauderdale and Miami Hamfests have seen several packet radio stations in operation. One of these, using an Apple Macintosh connected to a TAPR tnc, has drawn much interest. The terminal program running on the Macintosh, called MacPacket I, provides a split screen display along with menu selection of all user features of the TAPR board.

As promised in previous issues of the Beacon, I will soon provide a description of the program and its use. The program currently is near completion, with a few details remaining. Watch next month's Beacon for more details!

- Jack Brindle, WA4FIB.

MODEM For VHF/HF Packet

I have made available through FADCA a modem design which will satisfy a great many needs in the Packet Radio community. This modem can be built to be either 1200 baud with a 1KHz shift (VHF standard) or a 300 baud with 200 Hz shift (HF standard) using the Bell 103 originate tones. The main components of the modem are the XR2206-XR2211 chip set. The circuit board measures 1 1/2 x 3 inches small which allows it to fit almost anywhere. It also features a selectable Carrier Detect level of 0 or 5 volts DC to make it easy to interface with your system. If your packet rig is also used for your regular voice contacts, the modem has an audio mute circuit which, when enabled, will turn off the tones.

The N2WX-7 digipeater in Melbourne is using one of these modems and its performance seemed to make Howie (N2WX) very happy. Ted Huf (K4NTA) is also a proud owner. They had encouraged me to go public on the modem. FADCA is having an independent test done to verify the modem performance. However, because of the demand for them, we have contacted a local firm to go ahead now and make 100 circuit boards. These boards should be available sometime early in March.

I will be handling distribution for FADCA and am now taking orders for the modem board. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. The parts list is quite small and contains no strange or hard to find parts. I will help in getting parts if you can't seem to locate them. Most can be found at your local Radio Shack.

The bottom line ..... the modem kit as described above is a mere $8.95 which include shipping and handling charges. If you are interested, send $8.95 per board in check or money order to:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

Get yourself a super modem and help to support FADCA at the same time. I will be glad to help in any way I can.

73's Jerry (N4AJH)

THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover.

WD4FAB has a brand new George Rich (GRI) ASCII OEM keyboard for sale. It comes complete with a nicely finished case and enough information for easy interfacing to any computer. Price $40.00, FOB Maitland. Call Dick at (305) 644-9008 or write to Dick Jansson, 1130 Willowbrook Trail, Maitland, FL 32751.

NEW HAMTRONICS DIGITAL FSK DATA MODULES

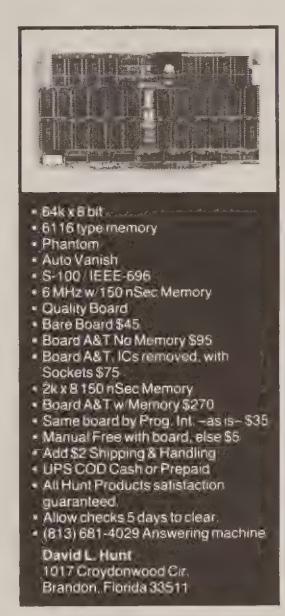
Hamtronics, Inc. has announced two new modules to provide for data interface with radio equipment using the popular "202" modem format (1200/2200 Hz tones) at data rates up to 1200 baud on ordinary nbfm channels. In addition to modulating and demodulating the data pulses, these modules provide transmitter keying and rull handshake facilities.

The MO-202 FSK Data Modulator is a pc board module only 1 7/8 x 4 inches. It automatically keys the transmitter in response to a "request to send" input from the computer, and it provides a "clear to send" handshake 25 milliseconds later, after the transmitter and receiver have had time to respond. Relative levels of the 1200 and 2200 Hz space and mark tones is equalized to compensate for the EIA pre-emphasis in the transmitter for maximum signal range. The MO-202 is $45 in kit form.

The DE-202 FSK Data Demodulator is a pc board module only 1 1/2 x 4 inches. It can be used with any fm receiver or transceiver to detect fsk transmissions and automatically provide a "receive carrier detect" handshake to the computer when mark or space tones are present. A special frequency compensation circuit levels the two tones coming from the receiver to allow for maximum weak signal response. The DE-202 kit is $38.

Both modules include 12 Vdc power supply input, operation with either RS-232 or TTL computer interface, and built-in LED test indicators for each function. The MO-202 can switch B+ at up to 600 mA for transmitter keying.

For more information on these modules call (716)392-9430, or write to Hamtronics, Inc., 65-F Moul Road, Hilton, NY, 14668-9535.


• 64k x 8 bit
• 6116 type memory
• Phantom
• Auto Vanish
• S-100 / IEEE-696
• 6 MHz w/150 nSec Memory
• Quality Board
• Bare Board $45
• Board A&T, No Memory $95
• Board A&T, ICs removed, with Sockets $75
• 2k x 8 150 nSec Memory
• Board A&T w/ Memory $270
• Same board by Prog. Int. -as is- $35
• Manual Free with board, else $5
• Add $2 Shipping & Handling
• UPS COD Cash or Prepaid
• All Hunt Products satisfaction guaranteed.
• Allow checks 5 days to clear.
• (813) 681-4029 Answering machine
David L. Hunt
1017 Croydonwood Cir.
Brandon, Florida 33511

The Utah Packet Radio Association (UPRA) came into being on January 5, 1985, in Salt Lake City, Utah. The organization was born at a meeting of twenty local hams interested in packet radio, four of whom are already active on the mode. UPRA was formed to spread the word about the packet mode and to create a packet network betyween Salt Lake City and Denver, to be followed later by links toward the Pacific Northwest and Southern California. For more information,contact:

David J. Pederson, N7BHC, President
4382 Cherryview Drive
West Valley City, UT 84120

FADCA>BEACON

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association (FADCA), 812 Childers Loop, Brandon, FL 33511.

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Membership Services - Pat Shaughnessy, KF4EF
...And lots of help from many others. Thanks!!

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Ted Huf, K4NTA	Dick Klein, W4PCM
Tom Kneisel, K4GFG	Gwyn Reedy, W1BEL
Bill Sams, KF4LG	Bill Whitaker, WD4JKM

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DIGITAL EVENTS

FEBRUARY 23. Ft. MEYERS Hamfest with FADCA booth and lecture. Contact KB4CIA or W1BEL.
MARCH 2. HERNANDO County Hamfest. Contact W1BEL.
MARCH 9/10. ORLANDO Hamcation. FADCA presentation and demonstration both days. Contact K4AHO.
MARCH 30/31. 4th ARRL Computer Networking Conference, San Francisco.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00
Half page	$17.00
Quarter page	$10.00
Eighth page	$ 6.00

Small classified advertisements for FADCA members will be without charge.

Rates are based on a monthly circulation of 250 copies. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

MEMBERSHIP DUES

FADCA membership dues for 1985 were payable as of January First. The basic dues are $12.00, but because of the 1984 dues incentives, each individual's 1985 dues may vary. See the address label on the January issue. If 1985 appears, your dues are paid up. If 1984 appears, your dues appear in parentheses following the year. If the line following the callsign is blank, you are receiving a complimentary or introductory copy. February will be the last issue for those 1984 members that do not renew for 1985. If you enjoy the BEACON and support FADCA's work, please give serious consideration to applying for membership. Be sure to bring any mistakes to our attention. Payment is requested by check, payable to FADCA.The deadline for inputs for the MARCH issue of the FADCA > BEACON is MARCH 14th. Articles should be in final form using a 55 character line length.

THE FLORIDA AMATEUR
DIGITAL COMMUNICATIONS ASSOCIATION
812 Childers Loop
Brandon, FL 33511

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 3 Brandon, Florida March 1985

SQUELCH TALES

Keith O'Brien, N4ZQ

NEWS FLASH - DATELINE ORLANDO HAMFEST.

Kantronics Inc. today admitted that it will soon be in the Packet business. Having been secretly working behind closed doors for the last 9 months, a company spokesman let it be known that their enterance in Packet Radio will be forth coming in the next few weeks.

A few months ago, in my BEACON ramblings, I mentioned how easy it was for me to get on RTTY/ASCII/AMTOR using my VIC Computer and Kantronics software. How Kantronics had been very successful in integrating the home computer with amateur radio, and responsible for the explosive growth in digital ham communications. I also wondered if Kantronics was even thinking of getting into the Packet Racket. After a long conversation with Travis Brann (WA5RGU) Kantronics Service Manager, and with his permission, we can here announce that they have indeed jumped onto the packet scene. To be offically unveiled at the Dayton Hamfest, we got to see the advance ad releases scheduled for the May ham publications. Kantronics has also taken the hardware approach, but this time with their own design and not a TAPR TNC clone. Fully assembled and tested, it's both AX.25 and Vancouver compatible. A new wrinkle is that it supports both Bell 103 and 202 design. Their claim is that they have made it easier to hook up and get on Packet. With a suggested list price of $389.95, it's considerably cheaper then the AEA PKT-1. Also noticed at the bottom of the ad was the fact that they were not going to neglect the software end of the business. Soon to follow the hardware package, will be Packet terminal programs for some of the more popular computers. This probably means, if they follow suit with their RTTY software, the Apple, Vic/C64, Atari, and TRS-80C. One can only dream of split screen, data transfer, and type ahead buffer. Look for some very interesting things to be coming along with Kantronics enterance into Packet.

Orlando Hamfest '85, WOW! What a show, and probably the best we seen from the City Beautiful in some time. Easy to get to, super facilities with plenty of space, and a gigantic crowd. After a few ho-hum shows over the past six or so years, the Big O gang have really got it back together. It appeared that the once biggest hamfest in the state, might just recapture the title again from Miami. The indoor air conditioned swap area was just monstrous, with some of the widest aisles I've seen to handle the biggest of crowds. One of the ways I judge a Fest is by the ease of parking, and I had no problem getting close to the Expo Centre, an hour after it opened Saturday. And was FADCA there? You bet it was, First Class all the way. Jim, K4AHO, did an outstanding job on setting up the packet activity. A tip of the hat, for a job well done by Jim and company. It really appears that packet has come out of the back room to stand with the best of the show. For those of you who weren't in packet or forgot about Orlando 84, let me remind you that the packet display was literary down the end of the third floor hall in a back room! One had to be lost to find it. 1985 found packet on the main floor with the Big Boys. You couldn't miss it, as most had to go pass the booth to get to the swap area. The Saturday afternoon meeting was well attended and much was learned by all. Primarily geared for those that are on packet now, we noticed many that stayed for the entire forum who were just interested and thinking of getting in on the action. The 2 hour forum occupied the largest meeting room available. It's going to take something to top this show for Packet in Central Florida, but wonder what next year will bring.

Orlando gave me the first opportunity to see the Heathkit HD-4040 packet kit. Must emit that I personally like the lower profile of their cabinet. The release of the HD-4040 is set for the second week of April, but the lack of a Heathkit manual might slow it down a bit. Just wonder how they can improve on a superb TAPR

I'm on my way to the SOUTHNET Packet Conference at the University of Florida, Gainesville, June 15 and 16.

document. Should make for some interesting reading, I would think. Heathkit was one up on the AEA booth, in that they had there TNC running on the air and connected to Zenith computer. Many had the chance to have a packet hands on experience, with a nice looking Benton Harbor setup.

Double Talk. At my location I have a Vic computer, as well as a 64. The Vic is dedicated to digital work on RTTY and AMTOR, both HF and VHF. The C64 picks up all the other chores, such as word processing, entertainment, as well as the Packet terminal. Having only one 1541 disk drive to share between the two computers, puts me in a bind at times. I usually like to copy a file, and be able to download it right away. But this necessitates using the computer for two different functions. But by being able to share the disk drive between the two computers, allows me to keep the communication program running on one, and doing the downloading on the other. The best part of this all is that it won't cost you a dime.

This miracle is accomplised by taking advantage of the dual serial ports built into the 1541 disk drive. By plugging both computers into the same disk drive and "fooling" the drive into thinking that each computer is the only one hooked up, you can create a single data pool hooked up to two computer pipelines. First, set up both computers as normal. Next, plug both computers into the single 1541 disk drive. If one of the computers is a Vic-20, turn it on first as the C64 will tend to drown out the Vic's monitor. After both computers are on and showing "ready", turn on the disk drive. For your first experiment use a write-protected diskette with a few programs on it. Insert the diskette in the usual manner and type the following on either computer: LOAD"$",* Replace the * with any disk drive number that the drive is "not" currently set to. For example, when you first turn on your drive it is device number 8, so * could be a 9, 10, or 11. After hitting RETURN the computer will give the usual SEARCHING message and then it will "hang up" and not load anything. Do not be alarmed. Simply walk over to the other computer and type the following command: LOAD"$",= Replace

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	Excerpts From Other Publications
	Advertisements
	FADCA Nets and Packet Frequencies
	Updates to the SOUTHNET Map
	RS-232 Converter for the Vic/C-64

SQUELCH TALES (continued from pg.1)

the = with the device number that the drive is currently set to, Usually 8. With a little luck an error message and blinking cursor will appear on both monitors after you hit RETURN. Assuming this happens merely retype the = command on the same computer and hit RETURN. Your = computer should now read the directory from the diskette in the drive. When the red light on the drive goes off, try typing LIST to verify that the directory was loaded. Now try the LOAD command on the * computer using the = device number in the command. It too should load the directory and list it on command. If by poor luck, only one computer was not "hung" after the inital = command continue to type the = command on whichever computer is not "hung up" at the time. Eventually you will succeed in getting both machines to respond with error messages and blinking cursors. Once both computers are functioning properly you can load the same program on both and access a shared file on the disk. Be careful that both machines don't try to access the drive at the same time as they will hang up and lose data.

$49... Keith

SOUTHNET

WIDE-AREA DIGIPEATERS

ATLANTA:	WB4GQX-1, KD4NC-1 (146.13/73)
MACON:	WB4GQX-2
SOUTH GEORGIA:	KF4JF-1
JACKSONVILLE:	WB4RCY-1
GAINESVILLE:	KF4TT-1
OCALA:	K4OZS
ORLANDO:	N4JWX
MELBOURNE:	N2WX-7
LAKE WALES:	KE4PM-1
TAMPA:	W1BEL, W9DVM
CLEARWATER:	KC2FF-7
STUART:	K4NTA-1
OKEECHOBEE:	WA4IYY-1
W. PALM BEACH:	WA4ARE-1
FT. LAUDERDALE:	W4LDP-1, WA1JOU
MIAMI:	W4NVU

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 0800 EST. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 1930 EST. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 2000 EST. NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 2000 EST. NCS: K4GFG
SOUTHNET statewide frequencies:
Primary LAN and calling frequency:145.010
Local QSOs & file xfers:145.030 /050 /070 /090
220 LANs (20 KHz bandwidth): 221.720, 221.780
Narrow bandwidth linking (20 KHz b/w): 221.400
Medium bandwidth linking (100 KHz b/w):220.570

SOUTHNET ELECTRONIC MAIL SERVICES

BULLETIN BOARD SYSTEMS

MOULTRIE, GA: WB4ZNW (W0RLI Mailbox)
STUART (EAST CENTRAL FLORIDA): K4NTA, WD4KAV
WEST PALM BEACH: WD4LHF
MIAMI: NK4K

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM, N2WX [75006,702], K4GFG
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL

GOOD LAN OPERATING PROCEDURES (Courtetsy the GRAPEVINE)

1. TXD 8,
2. CWID OFF (PERM),
3. Beacon maximum of once per 30 minutes if at all.
4. Do not beacon through more than one digipeater unless mesage is important to all.
5. On 145.01 choose the most efficient route or direct connect. If direct connect possible, move to 03/05/07/09.
6. Use BBS at non-peak "chat" times.

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

The packet radio activities at the Orlando Hamfest were a big success. Jim Diggs, K4AHO and the gang in Orlando did a wonderful job of setting up all the activities and a big vote of thanks goes out to them.

On the night of Sunday March 15th we got our first thunderstorm of the year. The Stuart digipeater is located at a CATV tower site about 3/4 miles from my house. About 2200 hours while I was watching the Holmes - Bey heavyweight fight on TV, in rolls the storm. Sure we needed the rain, but we could have done with out the lightning! When the storm was over, I checked K4NTA-1 and sure enough, it was out. The next day on a visit to the site, I found that the TNC was dead. Replacing the blown fuse producted sparks from the board and another blown fuse. What I found was a very charred PC board under the bridge rectifiers. To make the story a little shorter, on Sunday I changed the call on K4NTA-0 to K4NTA-1 and moved the TNC from the Stuart BBS over to the digipeater site. George, WD4BRF, is tring to repair the TNC but it looks like most if not all of the chips are bad.

I felt that I had provided good protection for K4NTA-1, but perhaps not. The Cable Company has a very good ground system for its 450' and 180' towers and three earth stations. This ground system consist of some 40 - 50 sixteen foot copper weld gounds rods all bonded together with #1 gauge solid copper wire. The K4NTA-1 radio cabinet and coax is bonded to this ground system. In addition, I have a very large MOV device installed across the 120 VAC that powers the digipeater. Proper gounding and protection is very important to us in Florida, so here is a call for help from anyone expert in this field.

I hear from George, WD4BRF,that we should use caution with the R/S swithching power supplies. Geroge tells me that there is no overcurrent protection on the output and that a short on the output could (and did on his) cause the pass transistor to short. This did blow the fuse on the input but when the fuse was replaced, the output voltage was up to around 30 VDC. George suggests that the output be fused or current limited with a large resistor.

SOUTHNET MAP UPDATE, Version 1.1

The following stations should be added to your present map listing which appeared in the February issue of the BEACON.

CALL	NAME	CITY & STATE	LAN
WD4EPK	ERNIE	KEYSTONE HTS,FLA	GAINESVILLE
KF4JF	BBS	HAHIRA,GA	SO. GEORGIA
WD4ZNW	BBS	MOULTRIE,GA	SO. GEORGIA
WE4W	RICK	TAMPA,FL	TAMPA
KF4CW	ERNIE	TAMPA,FL	TAMPA
W4MJX	FRED	APOLLO BEACH,FLA	TAMPA
N4IXU	BILL	BRANDON,FLA	TAMPA
K4PT	ED	SUN CITY CENTER,FL	TAMPA
WD4MAF	GLEN	PANAMA CITY,FLA	PANHANDLE
WD4FJE	VIRGINA	PANAMA CITY,FLA	PANHANDLE
WA4OPA	JOHN	MAITLAND,FL	ORLANDO
WB4LOQ	JOHN	TALLAHASSIE,FLA	TALLAHASSIE
N4FHO	RON	PANACEA,FLA	TALLAHASSIE
KB4CIA	RICK	PORT CHARLOTTE,FLA	FT. MEYERS
KB4CIB	TINKER	PORT CHARLOTTE,FLA	FT. MEYERS
WD5EBW	ANDY	FT. MEYERS	FT. MEYERS
KF4IN	DAN	SATELLITE BCH,FLA	MELBORNE
N4AJH	JERRY	MELBORNE,FLA	MELBORNE
WD4KAV	BBS	STUART,FLA	STUART
WA2EXQ	LLOYD	FT. LAUDERDALE,FL	FT. LAUD.
WA1JOU	DIGI	FT.LAUDERDALE,FL	FT. LAUD.
KB4AR	BILL	PENSACOLA	PANHANDLE
KB4MD		PENSACOLA	PANHANDLE
WA5MPI	WALT	GAUTIER,MISS	MISSISSIPPI
KB4JHV	MIKE	MOBILE,AL	MOBILE
W4ATK	JIM	BIRMINGHAM,AL	BIRMINGHAM
K4HAL	HENRY	BIRMINGHAM,AL	BIRMINGHAM
W4HFU	FRANK	HUNTSVILLE,AL	HUNTSVILLE
WA4YQT	TOM	ENTERPRISE,AL	SE ALABAMA
KE4PM-1	DIGI	LAKE WALES,FL	SEBRING

CORRECTIONS TO MAP:

WB4EXN's name is Tony not Bill, as listed in the Gainsville LAN.
W4SS should be listed in the West Palm Beach LAN not the Ft. Lauderdale LAN. FADCA sponsors the SOUTHNET packet network.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

The past two months have been hectic on the hamfest circuit. Since the Miami Hamboree the first weekend of February, I have attended hamfests all but two weekends. The fests included (in addition to Miami) Fort Meyers, Hernando County, Orlando, and Fort Walton Beach. I wish to thank each of the many persons at these various locations that have helped make successful packet demonstrations possible.

The reception for packet presentations has changed considerably since last year. Where formerly a swap table for dispensing literature and setting up a packet terminal had to suffice, the rule now is a place on the forum schelule. The Clearwater ARRL Suncoast Convention is a good example. In 1983 a notice was placed on a bulletin board in the lobby announcing a packet seminar to be held later by the as yet unformed FADCA. A year later we rated an hour seminar and a display table in the high-traffic ticket area. This coming season, we will have two seminar rooms continuously for two days, and the theme of the convention will be digital communication.

Another event is being planned that is a first for Florida, a packet hamfest. As in the fashion of digital repeater becoming digipeater, I will coin the term, packetfest. Our packetfest is named the SOUTHNET Packet Conference and it will be held at the University of Florida at Gainesville on 15 and 16 June. The University facilities and all the local arrangements are courtesy of the Gator Amateur Radio Club, the Co-sponsor of the event with FADCA. We named it SOUTHNET Packet Conference to widen its appeal to packeteers in the neighboring states, and to give it a businesslike, technical air. We intend to make it a full two days (and maybe Friday evening too) of interest to packeteers of all levels of technical ability. There will be technical meetings for persons involved/interested in linking; protocols, digital hardware and RF hardware, frequency coordination, emergerncy communication, satellite operations, and many other areas. A special feature will be clinics to allow hands-on experimentation with new packet equipment, computers, set-up and repair of TNCs, interfaces to computers and radios, Xerox 820 boards etc. There is a lot of planning and hard work to be done, but this should be an affair not to be missed by any serious packeteer. See the letters column for additional details, and volunteer your help.

The first formal meeting of the FADCA Board of Directors was held in conjunction with the Orlando Hamfest. Bylaws and Articles of Incorporation were reviewed and approved, officers appointed, and general guidelines established for the conduct of FADCA affairs in this time of rapid growth. The next meeting will be at the SOUTHNET Packet Conference in June. As soon as the incorporation is finalized, an election of directors will be held. Some appointed directors may not run for election due to other commitments, so if you are interested in serving as a Director, make your feelings known.

Sunday, March 24th, the Lake Wales digipeater was installed. Sam Bayne, W4KUM, had offered tower space at the Miami Hamboree in 1984. A test digipeater installation was made in the following spring with excellent results. Efforts since that time to make a permanent installation came to a focus this month. The Lake Wales Repeater Association furnished an antenna for rebuilding Feb 24th. KF4EF disassembled the antenna and KF4LG glass beaded the elements. N4ZQ reassembled the antenna and hauled it and the 320 ft of 7/8 hardline to the site. K4NTA donated the hardline. KE4PM and N4EIE did the tower work and K4AHO worked on the GLB board all day. When the board would not respond properly to the radio, he installed his TAPR board for an interim stay. I watched and generally got in the way of the work party. The installation took about eight hours plus travel. The four bay antenna is located at about 300 feet (450 ft above sea level). The rig is running 10 watts output and is easily readable on both coasts. The only problem is that the antenna is mounted in close proximity to the antenna of W4KUM's RTTY MSO antenna, and when the MSO is transmitting, the digipeater is deaf. The antenna was not planned to go in its present location, but was mounted there temporarily while the hardline was pulled up the tower. Then winch trouble happened and the termporary location became semi-permanent. Options for improving the situation are being considered.

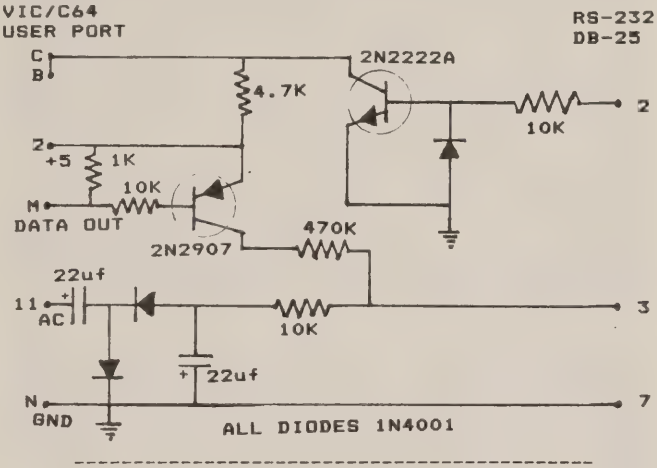
RS-232 CONVERTER FOR VIC/C64

Keith O'Brien N4ZQ
203 Faithway Drive, Seffner, Fl. 33584
(813) 685-3009

In response to the call for a simple interface between a Commodore computer and a TNC, we offer the following. The circuit shown is an RS-232 converter for the Vic/C64. It can be used with a modem, printer or other RS-232 device. It is much simpler than the one described in the August 1982 COMPUTE, and works just as well. Most RS-232 communications can be done with only three wires so I did not include converters for handshaking signals. The transistor converters are similar to the ones used in older Ohio Scientific computers.

Some RS-232 devices will have to have the wires to to the DB25 connector pins 2 and 3 reversed. If it does not work one way, then try reversing the wires. Putting a switch in to do the reversing will aid the operation.

The 12 pin dual edge connectors that are used on the computer side are hard to find. I found mine at the hamfest. You could make one by trimming down a 22 pin dual edge connector, if you're desperate enough. Happy building... Keith



THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 4 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The order delivery is promised any day now..

WD4FAB has a 16 element KLM 2 meter beam for sale. Call Dick at (305) 644-9008 or write to Dick Jansson, 1130 Willowbrook Trail, Maitland, FL 32751.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
305-723-8659

PACKET RADIO LINKS
MARCH OF DIMES "WALKAMERICA"

MARCH 23RD HOSTED THE FIRST LOCAL PUBLIC SERVICE EVENT IN SOUTH FLORIDA KEYED TO PROVIDE INTERCOMMUNICATION BETWEEN THE THREE MARCH OF DIMES FUND RAISING EVENTS, SO THAT THE REGIONAL DIRECTOR COULD GET INSTANT STATISTICS. THE WALKS RAISE MONEY TO BE USED IN CHILD BIRTH DEFECT RESEARCH, THE MAIN THRUST OF THE MARCH OF DIMES SINCE THE POLIO VACCINE WAS INVENTED. EACH WALK HAS THOUSANDS OF PEOPLE PARTICIPATING, WITH ELABORATE LOGISTICS COORDINATING IT ALL. THE MIAMI WALK IS CO-ORDINATED BY 70 AMATEUR RADIO OPERATORS, PROVIDING COMMUNICATIONS FOR ALL ASPECTS. SIMILAR ARRANGEMENTS ARE FOUND IN FT. LAUDERDALE AND WEST PALM BEACH.
KI4T-1 WAS SET UP IN THE DADE COUNTY OFFICE OF EMERGENCY PREPAREDNESS COMMUNICATIONS VAN, CONSISTING OF A 40 WATT TRANSCEVER, AN AEA TNC, A TRS-80 MODEL III COMPUTER, AND AN EPSON PRINTER. THE VAN, A CONVERTED ARMY DEUCE-AND-A- HALF TRUCK, HAS A 40 FOOT CRANKUP TOWER, ON WHICH A COMMERCIAL VHF FIBERGLASS GAIN ANTENNA WAS PLACED. ALL OF THE ABOVE EQUIMENT IS OWNED BY DADE COUNTY, AND COMPRISES THE COUNTY'S PACKET RADIO STATION, AVAILABLE FOR ALL AMATEUR PUBLIC SERVICE AND EMERGENCY COMMUNICATIONS EXCERCISES.
AT THE FT. LAUDERDALE END WAS WB4MMP, AS BASE STATION PACKET, AND TOM, K4GFG MOBILE PACKET. IN WEST PALM BEACH, KB4IQM PROVIDED THE PACKET STATION. THE FT. LAUDERDALE STATION CONSISTED OF A RADIO SHACK COCO AND TAPR BOARD, AND A 30W GE MASTR-PRO FEEDING A 5/8 WAVE WHIP ON TOP OF A MOTOR HOME. K4GFG'S MOBILE STATION SPORTED TOM'S TRUSTY GLB TNC, TRS-80 MODEL 100 TERMINAL, AN IC-2AT, AND 70 WATT AMP. (I STILL CAN'T FIGURE OUT HOW TOM DRIVES AND TYPES).

THE LINK BETWEEN FT. LAUDERDALE AND MIAMI WAS CLOSE TO A PIPELINE, ONCE W4NVU GOT BACK ON THE AIR. AS MURPHY'S LAW WOULD HAVE IT, IT WENT DOWN THE EVENING BEFORE WITH A BLOWN FUSE. THE FT. LAUD - MIAMI PATH CONSISTED OF 4T-1 TO MMP V NVU, GFG. TOM, K4GFG'S HOME STATION WAS A GOOD 10 MILES FROM THE WALK SITE, BUT PROVED AN EXCELLENT PATH.

AS THE DAY PROGRESSED, MMP AND 4T-1 PASSD DATA SUCH AS LEAD RUNNER TIMES, AND WALK PARTICIPANT COUNTS. UNFORTUNATELY, THE LINK TO IQM IN WEST PALM PROVED UNRELIABLE, AND MOST CONNECTIONS RETRIED OUT BEFORE GOOD DATA WAS PASSED. KB4IQM WAS ALSO PLAGUED BY TNC CRASHES DUE TO LINE VOLTAGE FLUCTUATIONS. WELL, THAT'S HOW WE LEARN.

THE EXCERCISE TAUGHT US A NUMBER OF THINGS:

1. DEFINE YOUR OBJECTIVES FOR PACKET RADIO, RECOGNIZING ITS STRENGTHS AND WEAKNESSES. USE IT FOR NON-REAL-TIME, STORE AND FORWARD COMMUNICATION. USE IT TO FREE UP AN OPERATOR TO DO OTHER THINGS, SUCH AS VOICE COMMUNICATIONS. THEREFORE,
2. USE A PRINTER FOR PUBLIC SERVICE EVENTS. PACKET EXCHANGES SHOULD ESSENTIALLY BE ONE-WAY. STATION A LEAVES DATA FOR STATION B. LATER, STATION B SENDS DATA TO A TO BE PRINTED OUT AND USED AS NECESSARY. NOW THE ABOVE WORKS ONLY IF,
3. ALL DIGIPEATERS USED HAVE GOOD THRUPUT WITH ONE ANOTHER. A LINK WITH MANY RETIES ONLY FRUSTRATES THE EFFORT, AND IN ORDER TO INSURE GOOD THRUPUT,
4. ALL DIGIPEATERS IN HIGH INTERMOD ENVIRONMENTS MUST USE BAND PASS CAVITIES FOR INTERMOD FILTERING.

WHILE YOU DON'T HAVE TO RUN A MARCH OF DIMES EXCERCISE TO LEARN THE ABOVE, IT TAKES A GOOD PUBLIC SERVICE EVENT, WHERE PEOPLE OTHER THAN YOURSELF ARE RELYING ON THE INFORMATION TO HAMMER HOME THESE POINTS. WHILE WE ARE LESS CRITICAL WITH PACKET PERFORMANCE FOR OUR OWN PERSONAL USE, WHEN OUTSIDERS EVALUATE ITS PERFORMANCE, THEY AREA LOT LESS FORGIVING OF ITS INADAQUACIES.

NEXT YEAR WE WILL TAKE THE ABOVE INTO CONSIDERATION, PASS A GREAT DEAL MORE DATA, AND HAVE IT GET TO ITS DESTINATION A LOT MORE EFFICIENTLY. AND MAYBE ALONG THE LINE,THE SOLUTION TO A CHILDHOOD BIRTH DEFECT WILL HAVE BEEN HELPED.

BY JOEL I. KANDEL, KI4T

To: All
From: Pete WB9FLW
Subject: TAPR TNC & ENCLOSURE FOR SALE

A friend of mine Jim K0SBH has a mint TAPR TNC in the Gucci cabinet for sale he is asking $300.00. If interested you may contact him after 6:30 P.M. at (314) 946-2058.

9600 BAUD MODEMS FOR GATOR-ONE

Tom Kneisel K4GFG
1600 S.W. 115 Ave., Davie, Fla. 33325

Steve Goode, K9NG, has finished his 9600 baud modem design, and plans to present a paper on it at the San Francisco conference. The modem is designed to work with the Hamtronics FM-5 or similar transceivers, and FADCA is planning to use them in our GATOR ONE linking network on 220 Mhz.

I presented some details of Steve's design at the Orlando Hamfest, including the required modifications to the FM-5 and Steve's performance measurements. The modems have been field tested in Chicago, and appear to be working well. TAPR plans to provide a PC board (and maybe a complete kit?) for the modem, but the availability date is not yet known.

In the meanwhile, K4OZS is wirewrapping two modems which will be tested on the bench and then in the field here is south Florida. If you would like to wirewrap a modem for your GATOR ONE site instead of waiting for the PC board, see me for a schematic and parts list.

Another alternative for experimentation at 9600 baud is to use a telephone modem. Four ICC 96 MM modems have been donated to FADCA by Racal-Milgo here in Ft. Lauderdale. These are 9600 baud, 8 phase, 2 amplitude modems which work within the 3 Khz audio passband. I have bench tested them with the Hamtronics R220 receiver, and they work fine, although require about 10 dB more RF signal than the K9NG design. If you have a solid RF link, why not try them? See either W1BEL, K4NTA, or myself to obtain a pair of these modems. More are available if needed.

MODEM For VHF/HF Packet

FADCA is producing a modem which will satisfy a great many needs in the Packet Radio community. This modem can be built to be either 1200 baud with a 1KHz shift (VHF standard) or a 300 baud with 200 Hz shift (HF standard) using the Bell 103 originate tones. The main components of the modem are the XR2206-XR2211 chip set. The circuit board measures 1 1/2 x 3 inches small which allows it to fit almost anywhere. It also features a selectable Carrier Detect level of 0 or 5 volts DC to make it easy to interface with your system. If your packet rig is also used for your regular voice contacts, the modem has an audio mute circuit which, when enabled, will turn off the tones.

The modem kit as described above is a mere $8.95 which include shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

Get yourself a super modem and help to support FADCA at the same time. I will be glad to help in any way I can.

73's Jerry (N4AJH)

BROWARD PACKET NEWS

Tom Kneisel K4GFG
1600 S.W. 115 Ave., Davie, Fla. 33325

Check-ins are growing on the local FADCA voice net on Sunday evenings (145.27 Mhz 8pm). Many new calls are showing up, and requests for packet literature are frequent. Several new stations are working on TNC's and we expect to hear them on the air soon.

The W4LDP-1 digipeater is off the air as of this writing. If it is not back in service by the time you read this, use WA1JOU to bridge the gap between Miami to West Palm. To the south, W4FQM reports his Hollywood digipeater will go on the air with the call WA4WHD-1 as soon as he receives his PKT-1 back from AEA. To the north, WA2HFA reports that the IBM club has voted funding for a TAPR board. Bob says they already have the RF gear for their digipeater site at 80 feet in Boca Raton.

The next local packet radio demonstration will be at the Hollywood Amateur Radio Club meeting on April 15, Hollywood Courthouse, at 8 PM.

EMERGENCY COMMUNICATIONS

Steve Crowley, N4AIY
614 Sanfield St, Brandon, FL 33511
(813) 689-9714

This month I present a few emergency communication related articles from other locations. Please write to me with your news and ideas for this column.

The Pierce County (Washington) Emergency Search and Rescue Council has purchased three AEA packet boards for use in their operations. To back up the TNCs, they have also purchased two KayPro 2Xs and a Radio Shack Model 100. The packet stations will be operated on 220 MHz equipment with the main station being located in the Tacoma County City Building.

John, W7KKN, has helped Tom, W7DRT, put together the stations. A second station, located in a motor home, will be used during Pierce County searches. The third station will be a completely portable unit that can be taken to a mountain tob by four wheelers or helicopter. Its primary function will be to provide a link between the search site and downtown Tacoma.

In the past, ESAR has been concerned with the security of traffic on amateur bands during searches. The press has learned that a great deal of information can be picked up by listening to ham operations on two meters. It is expected that packet will provide a measure of security like none they have enjoyed before.

....reprinted from Zero Retries, NAPRA newsletter.

Fm: Bill Tubbs KB6JM 70725,1422
To: HamNet*SYSOP Scott W3VS 76703,407 (X)

22-Mar-85 16:12:59 The Sacramento County Office of Emergency Operations plans to have a TNC on-line by the end of this summer, and is coordinating with the State Office of Emergency Services to establish links and work out details for use of packet systems in emergency and disaster situations. The plan is to have packet 'teams' within the County's newly revitalized RACES program and ARES, which would set up communications at appropriate sites during drills or actual emergencies. A good framework should be in place over the next year to accomodate the projected growth in this area.

Georgia Packet Networking Agent Agreement
Submitted by Bill Crews, WB2CPV

On February 9, 1985 at the First Georgia Packet Radio Coordinating Conference held in Macon, Ga, a committee was formed to be responsible for network coordinating efforts in the stste of Georgia. The committee, consisting of Dennis, WB4GQX, and Wayne, WD4LYV, is named the Georgia Packet Networking Agent. The state was divided into two parts along a line formed by I-16 from Savannah to Macon, continuing West along Route 80 to Columbus. WB4GQX will be responsible for North Georgia and WD4LYV will be responsible for South Georgia. When packet activity increases in particular areas of the state, directors will be appointed to represent those areas. The following priorities were established:

1. Coordinate high site, unattended digipeaters on a statewide basis using 145.01 and assist where possible with technical expertise, software, and on a case by case basis, financial or equipment aid.
   a. Pursue offers of possible sites in the Macon area due to its strategic location in the networking plan.
   b. Monitor efforts in the Valdosta area in expectation of a permanent digipeater installation.
   c. Have WD4LYV pursue several potential high altitude tower sites in the Southern part of the state for digipeaters.

2. Establish 220 MHz links between statewide LANs and also coordinate linking frequencies with Florida and South Carolina. 220 MHz was chosen for linking because the majority of link activity on the East coast is on that band. Also the current R & D with 9600 boud modems is being done on 220 MHz.

3. Form a committee to search for unused RF repeater pairs for possible utilization on packet.

CONNECT....

The Beginner's Column

DON DEEM, KB4LLO

This month's column will be concerned with letters from our readers, and assisting them with their problems. As you will see, these letters indicate the need to have a centralized source of information that would be of interest to beginners and potential FADCA members. At this time we would ask each of you that are on the air and operating to drop us a line, giving us the following information:

- Make and model of radio used in your packet system.
- Make and model of the TNC you are using.
- Make and model of the computer you are using.
- Source of the software you are using and a copy if possible.
- A schematic of the interface cables used.

You might also include a description of any problems or pitfalls you are aware of, and your suggestions.

We also ask for your suggestions as to the information that you feel should be included in our data base, or that you feel should be excluded.

Here are two letters which illustrate the need for this information.

Gentlemen:

This is a response from a previous QSO with A.R.S. WW4V, Jerry, who has informed me of your progress in 'Packet-Radio'. Our group here in Massena is rather small both community wise as Amateur wise. Our means of communication or, should say research concerning 'Packet-Radio' has been a bit limited. Our group consists of ten Amateurs currently in the construction stages of packet, and hope to soon be on the air with the systems.

We are currently constructing the 'Vancouver' board, and Tom, K2JPM is writing the software for the VIC 20. Guess our major concerns are that of being in sync with the rest of the Amateur world in respects to protocol etc...

Therefore you will find enclosed some funds to hopefully cover postage for your current newsletter, which we would like to use to help bring us up to speed with some of the other experimenters. Would also request any further information which you may be able to make available to us concerning various boards, protocols, and experiments which you may have already completed.

Thanks for your time and cooperation, and looking forward to hearing from your group.

73, de NA2B, Charlie

P.S. Questions:
1. Which boards are you using?
2. Which computers are you using?
3. Which software are you using?
4. Protocol?

FADCA:

Can you supply me with a laundry list of parts and sources to get my 2-meter operating on packet? i.e. which is best, simplest, most compact. My experimenter days are pretty much past due to the press of other activity.

73, Curt

EXCERPTS FROM OTHER PUBLICATIONS

ITEMS FROM DRNET

(DRNET (Digital Radio Network Design Net) is an electronic messaging system linking various centers of packet activity, courtesy of the NJ Institute of Technology.)

M 23844 Lyle Johnson (WA7GXD,2973) 3/19/85 10:39 PM

Gwyn,
We are now backordered 30 deep on TNCs. When we have some, we'll see you get some!!! I am also trying to arrange to bring some to San Francisco...
Look forward to seeing you there! More later... and keep up the ggod work there in Fl. You guys are doing great and benefitting the whole amateur packet community by your efforts and generosity.

Lyle

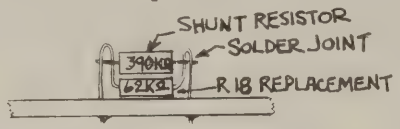
NON - ELECTRONIC MAIL

Dear Gwyn:

Thanks for the latest stupendous issue of the FADCA BEACON, it makes for a lot of good reading.

I have recently modified two of the Radio Shack 277-1016 switching power supplies according to the information received from RMPRA. On one point, R18, I found what I consider a better way of doing the modification. A couple of other points are also noted herein for publication in the BEACON.

In my experience with non-standard resistor values, it is always much easier to use parallel values rather than series values, although it is more of a mental strain. If a 62 kilohm 1/4 watt resistor is initially installed according to the method shown below, life will be easy:



By forming the leads of the 62 kilohm resistor, it makes a convenient pair of terminals for the piggybacked shunt resistor, in my case that value was 390 kohm. It is also easy to change that shunt resistor.

The next point is R7. It is definitely not a 1 watt power resistor, but a 1/2 watt, 240 ohm. If one does not have a 120 ohm replacement value, that is not critical, just as long as a lower value is used for more drive. A value of 150 ohm certainly is not out of order, and at a 1/2 watt rating it will easily go into the place provided for R7.

In my intended applications with a TAPR TNC in a "black box", there is absolutely no need for the on-board power control switch, S1. There is a need for three more lands to mount the series power isolation diode used when providing a battery back-up power for the AC supply. Removal of S1 by disassembly of the head, cuting the phenolic board to break it into disappearing pieces, and finally desoldering the switch pins will effectively remove S1. The lands for the positive lead are then used to mount the series diode and the red wire to the rectifier supply on the TNC. Using the White negative wire to jump the two negative pads together at S1 provides the negative lead for the rectifier supply. The original lead locations are used for the red and black leads to the battery back-up power supply.

73,

---------- Dick, WD4FAB

Dear Gwyn:

Many thanks for your letter of February 13th, and for your membership contribution. We are also very grateful to FADCA for your strong support of the Florida Repeater Council.

On behalf of the Florida Repeater Council, I would like to propose that FADCA be designated immediately as the packet network coordination body for the state of Florida. The Florida Repeater Council will, in effect, delegate to FADCA the authority to coordinate and manage the following areas:

1. Packet frequencies and band usage.
2. Packet channel loading.
3. Siting of digipeaters, gateways and other common-use packet network nodes.

In addition, we encourage FADCA to create and maintain its own database of digipeaters and other assignments. We would like you to periodically send the Council a hard-copy of this database, in order that the Florida Repeater Council can include packet systems in its official repeater listing.

I am enclosing a sample FRC coordination record sheet for your perusal. This may be of assistance to you in the development of a database. Of special importance are trustee name, address, and telephone number; we consider these a prerequisite for coordination.

The Florida Repeater Council will continue to protect frequencies in all amateur bands for packet and digital communications in a manner consistent with the existing band plan and with other modes.

When FADCA requests protection of a new packet frequency, we will analyze the request for potential conflicts and interference problems. In the event of a problem, we will inform you as soon as possible. If there is no apparent likelihood of conflict, we will publish a proposal for protection of the new frequency in the Council's monthly column in Florida Skip, with a one to two month comment period. Assuming that no adverse comments are received, we will then announce protection of the frequency.

As an example, we have just proposed to reserve 145.000 MHz as a vacant guard channel. We anticipate announcing protection of the 2 meter and 220 MHz frequencies requested by FADCA in the near future.

Should FADCA receive a complaint of interference on any packet frequency, please contact the Council. We will work with you as closely as is required in order to correct the problem.

It is our view that if a packet or digital system coordinated by FADCA (in its capacity as delegate of the Florida Repeater Council and as packet coordinator) is subjected to harmful interference by an uncoordinated system or by a station operating in another mode, then:

1. The interfering station has primary responsibility for correcting the interference.
2. If the interfering station is operating in another mode, and there is a consistent pattern of interference, a presumption may exist of deliberate and malicious interference to the packet or digital station.
3. In all cases, those packet frequencies which we have protected should be kept loaded to the maximum extent practicable by packet users, in order to establish channel occupancy.
4. As mentioned above, FADCA and the Florida Repeater Council will work together to resolve interference problems. An uncoordinated digipeater will be a FADCA responsibility, whereas an interference source using another mode will be a joint FADCA/FRC matter.

We would like you to keep us informed of all FADCA policy developments concerning digipeater coordination activity, in order that we may be constantly "in sync" on issues of mutual interest. It is most desirable that our two organizations speak with one voice on matters affecting us both.

My colleagues and I on the Florida Repeater Council are delighted to work with FADCA, and with you and Ted personally, to our mutual benefit. I am convinced that our joint efforts will greatly strengthen Amateur Radio in the state of Florida.

Best 73's
Adam M. Farson, VE3DGY
President
Florida Repeater Council, Inc.

The Gator Amateur Radio Club
5010-135 North Waldo Road
Gainesville. Florida 32601

Gwyn,

On March 14th and 15th the Gator Amateur Radio Club and the Gainesville Amateur Radio Packet Society demonstrated packet radio to the public at the University of Florida Engineers' Fair. On display was a TAPR TNC linked to the University's VAX and Harris computers via KF4TT-1. Unfortunately the band did not open during the fair's hours of operation, and the only QSOs were held with Bob, WD4BIW, Scott, KF4TT and Thornton, KU4F. There was a great deal of interest expresed in Packet and Amateur Radio in general.

Saturday March 30th is the date set for the "Second Annual Never Again to be Repeated Gainesville Swapfest". We expect tens of vendors this year from as far away as Waldo and Archer. This is the second edition of last years "We Won't ever do this again Swapfest" held during the '84 Engineers' Fair. There is free admission, no table fees (no tables), and no door prizes (no doors). You just drive in, open your trunk, and start trading. The fun starts at 9:00 AM and runs until whenever. The talk in frequency is 146.910. The Banquet is to be held at Wendys on Archer Road, Saturday afternoon. Reservations are not required.

Continued

The Gainesville digipeater, KF4TT-1, recently received a new power amplifier and is now outputting 140 watts. Links with KF4JF-1, KC2FF-7, and N2WX-7 are possible with slight band openings. TT-1 will soon be moving to its new 400 foot site in Melrose, abvout 20 miles to the East of Gainesville. The new location promises reliable links between N2WX-7 and WB4RCY-1. TT-1's old site on KU4F's tower is expected to become the local Gainesville digipeater as soon as another packet board can be found.

KU4F's TAPR kit finally arrived. Thornton should be on the air by the time this is printed. Connect to him via KF4TT-1 and welcome him to the network. Thornton is presently attempting to be the first ham to bounce packets off the Moon, and successfully decode the echo. His initial experiments resulted in signals too weak to be displayed by his TNC. A new amplifier and modem are under construction, and hopes are high for the next attempt.

At the Orlando Hamfest FADCA dinner, several members discussed the possibility of organizing a technical meeting involving all of SOUTHNET. After considerable discussion it was decided that the meeting would be held this summer at the University of Florida, in Gainesville. Much work has been done since that dinner. The date for the "SOUTHNET PACKET CONFERENCE" has been set for June 15th and 16th.

The SOUTHNET PACKET CONFERENCE will include as wide a range of topics as possible. There will be workshops and lectures covering all aspects of packet radio, from the basic problems of getting on the air to what protocol to use for level three. As the name implies, we intend to concentrate on problems concerning SOUTHNET, but we will be receptive to inputs from other areas. The conference will not be limited to technical discussions on hardware and software. We will have help sessions to aid those who want to get involved with packet. There will be workshops for the organization of message handling procedures, and emergency communications applications of packet radio, as well as lectures on "Digital Imagery" and military uses of packet.

June is not very far away, and there is still much work to be done. FADCA will be arranging for speakers, working out the scheduling of the different events, and advertising the conference. GARC will provide the meeting rooms, information about Gainesville, and generally act as the liaison betwen the amateur community and the University of Florida. Any help that you can provide to our two organizations would be appreciated. The contact point for FADCA is Gwyn Reedy (W1BEL). Prior to April 30th the best contact point for GARC is myself. After the semester ends at U of F most of the students, myself included, will disappear until the fall. Scott Fox (KF4TT) will then take over as GARC liason.

Thats about all of the information I have for you. We will try to keep you up-to-date on the situation at this end. Feel free to call me at (904) 373-0376 if you have any questions.

73's Joe (WA4NWO)

Gwyn Reedy, W1BEL
% FADCA

Dear Gwyn:

It seems like a long time since we used to have you check into our North Central Jersey Tech. nets on Sundays!

Just wanted to drop you a note to thank you for forwarding the FADCA BEACON to us. Enclosed is a check to cover past postage, etc. and keep it coming.

I will also take this opportunity to express my personal opinions relating to the expolosion of numbers of packet stations that the Heathkit-Zenith promotion is bound to generate....You may publish any part that may seem of interest to your group.

K2TKN has been in three wars on the Ham Bands - as WOETJ we helped start NBFM on 75 meters before there were crystal controlled 2 meter rigs - then rode out the jibes and catcalls getting SSB accepted on 75 and 20 - then opening up the high end of 2 meters with liberated taxi repeaters - that was enough, there is just no valid reason not to speak out when I see another war starting because of packet operation on heavily populated channels.

I am in favor of trying new modes of communication and applaud the VKs and your group's efforts to link widely spaced stations into a working network...but am violently against setting any form of standard (hardware or software) this early in packet. We need AX.25 as an entry-level protocol to get new stations operational and in contact with their local packet group, but it should be well understood that AX.25 on AFSK at 1200 baud is about at the technical level of spark transmitters and crystal receivers on long-wave. Our TNCs and particularly repeaters must be kept open for experiments with better protocols. Digipeaters (REGENERATORS) operating on lacal net frequencies at 1 to 1 speed ratios are doomed to failure just as soon as any real volume of traffic shows up. The Pony Express was great but went bust the instsant a wire was strung along the route! The full pageg ads promoting sale of packet equipment--"Everyone can be a REPEATER OWNER" and "automatic Digi-ptr with a few keystrokes" are the culprits and should be stood against the wall and shot for starting a war! Any TNC or repeater that the owner can't reprogram easily is going to be obsolete very quickly in this digital operation.

We think the next generation of repeaters will handle mixed modes of operation (baseband FM and SSB for voice and subcarriers for digital) but of utmost importance will be bulletin boards with gateway channels to DMA large blocks of memory to adjacent bulletin boards. Getting to this point is not going to happen overnight and requires a great deal of experimentation that poor protocols may hinder. As long as the experienced packet operator understands that the pasting and patching that attempts to make AX.25 a smart-term with link level 3 repeater capability has not improved throughput of data or resistance to collision link failure. The real advantage of packet is the ability to run many QSOs on the same frequency without interference and this takes squeeky-clean packet structures with short interrupt loops in the TNCs. Everyone keeps adding more tasks for the poor TNC to try to keep up with -- we are using a cut version in our local 220 net that is totally compatible (terminal to terminal) with any version of AX.25 but only uses a bit more than 3k of EPROM in a Vancouver or Ashby TNC. With C-64s sellihg for $129 and disk drives for less than $150 it makes sense to strip the TNC software to make it as transparent to ASCII as possible.

When two stations can be running MacPaint graphics on each other's machine, packet operation will have graduated High School...I don't want to speculate on College!

We have been running tests for several months on Doug Lockhart's (VE7APU) V2 protocol and find parts of it to be very clean, until he gets tangled up in designing another monitor--just what we don't need. We are stripping it down to bare-bones and find its throughput far exceeds AX.25 at the same link speed and very useful on our point-to-point microwave links. It only took a few minutes to assemble his source code and burn new EPROMS, make a simple wiring patch and any Vancouver or Ashby TNC is running V2--try that on your "OEM acceptable designs."

We need open source code for program modification that can be assembled on any CP/M or MS-DOS machine. ASM is not very fancy, but everyone has access to it--which they sure do not have with MAC, RMAC, M80, etc. Let the people who are hung up on Unix, Pascal, Forth, and C work on programming gateway controllers that will be totally transparent to us poor people! AND, used on channels we don't have to compete with!"

OK, off the soapbox, but I seem to be the only voice from the wilderness that keeps saying manufacturers that sell a few hundred units always try to prevent any improvement that may require them to modify those units already sold or admit they may be obsolete. If you hear of anyone that can make an EXAR chip set come anywhere near the performance of a Rixon or Telco 202 modem, please let me know. I've got a lot of customers having a hard time finding them at reasonable prices.

Meanwhile, keep up the good work, keep your net open to strange signals (they may be better). And publish anything that might work-------

Regards,
Bill Ashby, K2TKN
Box 332, Pluckemin, NJ 07978
(201) 658-3087

RETRIES

The 12vdc conversion article in the February BEACON should be corrected as follows: Under hook-up, step number 7, change U22 (pin 3) to read U23 (pin 3).

FADCA>BEACON

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association (FADCA), 812 Childers Loop, Brandon, FL 33511.

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...And lots of help from many others. Thanks!!

FADCA is a non-profit organization devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO
Ted Huf, K4NTA
Tom Kneisel, K4GFG
Bill Sams, KF4LG
Dave Frey, K3AAX
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Gwyn Reedy, W1BEL
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Executive Vice President - Ted Huf, K4NTA
Secretary - Don Deem, KB4LLO
Treasurer - Steve Crowley, N4AIY

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (4 ounces) 8 1/2 by 11 inch envelope to the FADCA address.To join, complete the membership application enclosed and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

The deadline for inputs for the April issue of the FADCA > BEACON is April 22nd. The April issue will come out in early May to allow timely coverage of the Dayton Hamvention. Articles should be in final form using a 55 character line length.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple issue contracts.
Half page	$17.00	
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a monthly circulation of 250 copies. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed: January 1985 - 500
February 1985 - 540

DIGITAL EVENTS

MARCH 30/31.	4th ARRL Computer Networking Conference, San Francisco.
APRIL 20/21.	Trenton Computer Festival, Trenton, NJ.
APRIL 26/28.	Dayton Hamvention.
JUNE 15/16.	SOUTHNET Packet Conference, University of Florida, Gainesville.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

The Florida Amateur
Digital Communications Assoc.
812 Childers Loop
Brandon, Florida 33511

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 4 Brandon, Florida April 1985

NEWS AND VIEWS

Gwyn Reedy, W1BEL

FADCA is on the move. Membership is at the 200 mark despite the procrastination of some members to renew for 1985. The current rate of growth will see us to the 300 mark by year's end. Packet activity is getting started in several new areas of the state: Daytona Beach, Tallahassee, Panama City, Ft. Walton Beach, and Pensacola. New callsigns pop up on the screen faster than they can be transcribed to the SOUTHNET master map. Linking efforts are coming to fruition soon, with GATOR 1 likely to be in test operation by June. Also in June is the SOUTHNET Packet Conference. We informally call it the Packetfest, and the things planned for it make it more exciting all the time.

Make your plans now to attend the SOUTHNET Packet Conference. It will be held at the University of Florida student union building on June 15 and 16. The Gainesville location was picked to be a bit more convenient to the Georgia, Florida Panhandle, and Alabama attendees. By the way, the event was named for SOUTHNET instead of FADCA because we want everyone in the Southeast (and from everywhere) to feel welcome.

Rooms are available in the union. A single is $27 per night, two persons $31, and rollaways are $3 additional. There are many variations in bed sizes and room sizes. Please contact the Guest Desk to make a reservation: (904) 392-1607 or Write to J. Wayne Reitz Union, U of F, Gainesville, FL 32611. All the student union rooms are being held for us till June 1st, but you should make your reservation early. Next month's BEACON will carry a list of motels in the area for those that care to stay off the campus. Many persons are planning to arrive on Friday afternoon, and an informal meeting will be arranged at a local eatery that evening.

The official program begins Saturday morning at 9 AM. Informality marks the entire event, and it will not be at all stuffy or boring. There will be a number of events and seminars going on simultaneously to appeal to everyone's tastes. We have ten rooms and the auditorium reserved for both Saturday and Sunday. Scheduled events will run until 5 PM Saturday, with a banquet or dinner starting about 6:30 PM. The early dinner will perhaps appeal to those visiting for the day only. Sunday the program will run from 9 AM to 3 PM to allow return travel.

The following list of events will take place at the packetfest. Additional items are being added regularly, and if you would like to present a talk or demonstration on any subject, please contact me for scheduling.

1. A workshop full of test equipment for testing digital and RF equipment, building cables and testing interfaces, etc.
2. Mike Baker, WA4HFR, will present a talk on digitized imagery .
3. Chris Ward will present a talk on the military applications of packet radio.
4. A tour of the Gator Amateur Radio Club Station. Bring your ham ticket so you can operate.
5. Satellite operation with emphasis on packet communication.
6. Packet radio in the CP/M environment by Bernie Mans, AA4CG.
7. Introduction to the W0RLI Mailbox system.
8. Introduction to networking protocols. The International Standards Organization layers of networking will be explained.
9. FADCA's Gator 1 network linking hardware and software will be demonstrated, including the K9NG 9600 baud adaptions of the Hamtronics FM-5 transceiver.
10. Howie Goldstein, N2WX, will present a seminar on his new electronic conferencing system that is mentioned in his article in this issue.

Continued on next page.

THE HOMEBREWED FRAME

Howard Goldstein N2WX, 681 Cardinal St SE
Palm Bay FL 32907-4116
<via compuserve 75006,702 / 2987%NJIT-EIES >

It's been a long time coming - FADCA is now shipping FADpad software for the Xerox 820 and FAD board*. ``Whatsa FADpad?'' Thought you'd never ask. FADpad is:

o - a TNC fully compatible with the AX.25 Level 2 Version 2.0 protocol specification (October 1984) with automatic recognition of connections with older non-version 2.0 code,

o - uses tried and proven TAPR command set and user interface for flexibility, familiarity, and power,

o - supports full duplex connections at data rates up to 9600 baud,

o - written in assembly language for compactness and speed (about 12K object)

o - available in EPROM form (2 2764's plus mods for the Xerox board) -OR- in a ready-to-run .COM file on an 8" CP/M diskette.

This software's been under development since late September 1984, and incorporates suggestions from myriad centers of packet activity around the country. See * for ordering information. (Special thanks go to: Paul Newland AD7I and Harold Price NK6K for their MANY fine suggestions without which FADpad would be difficult if not impossible to use. And also thanks to Bill Newkirk WB9IVR who back in 1983 convinced me that synchronous was the only way to fly those frames).

SEIE is the Systek Electronic Information Exchange which I was asked to comment on in this space in spite of it still being under development. Modelled on the New Jersey Institute of Technology EIES(tm) system, SEIE attempts to duplicate that user interface on a CP/M (2.x or 3.x) system. For a fairly complete description of the interface, and for justification of the EIES interface, see _The Network Nation/Human Communications via Computer_ (Hiltz, Starr Roxanne and Turoff, Murray, 1978). Dr's Hiltz and Turoff researched and documented most areas of difficulty USERS experience in computer communications systems and offer up suggestions to designers to help get around them. Some excerpts:

``Specific Short Items of Wisdom:
o-The most efficient structures for computers are not necessarily efficient for users....

Continued on next page.

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SOUTHNET

WIDE-AREA DIGIPEATERS

ATLANTA:	WB4GQX-1,	JACKSONVILLE:	WB4RCY-1
(146.13/73)	KD4NC-1	MELBOURNE:	N2WX-7
SO. GEORGIA:	KF4JF-1	STUART:	K4NTA-1
GAINESVILLE:	KF4TT-1	OKEECHOBEE:	WA4IYY-1
OCALA:	K4OZS	W. PALM BEACH:	WA4ARE-1
ORLANDO:	N4JWX	HOLLYWOOD:	WA4WHD-1
LAKE WALES:	KE4PM-1	FT LAUDERDALE:	WA1JOU
TAMPA:	W1BEL	MIAMI:	W4NVU
CLEARWATER:	KC2FF-7		

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 0800 EST. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 1930 EST. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 2000 EST. NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 2000 EST. NCS: K4GFG
CRESTVIEW (Panhandle): 147.360 (+600) Sunday at 2030 CST (after traffic net). NCS: K3NN
GAINESVILLE: 146.91 (-600) Monday at 8PM.

SOUTHNET statewide frequencies (Florida)

Primary LAN and calling freq:	145.010
Local QSOs & file xfers:	145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):	221.720, 221.780
Narrow bandwidth linking:	221.400 (20 KHz b/w)
Medium bandwidth linking :	220.570 (100 KHz b/w)

SOUTHNET MESSAGE HANDLING SYSTEMS (Mailbox/BBS/MSO)

SOUTH GEORGIA: WB4ZNW, KF4JF (WORLI Mailboxes)
ORLANDO: WB4TRJ
STUART: K4NTA, WD4KAV
WEST PALM BEACH: WD4LHF
MIAMI: NK4K

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM, N2WX [75006,702], K4GFG
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL

THE HOMEBREWED FRAME Continued

o-Effectiveness of an interface design is measured by the extent to which the user can forget there is an interface...

o-There is not much new in interface design, but a lot of rediscovery goes on...

o-In science, theory leads experiment; in interface design the opposite is true...

o-Users will evaluate systems in their terms, not in computer terms...

o-A system that does not evolve begins to die...

o-What you can count on for at least some users is that they are highly intelligent, too busy for any training course, very impatient, and intolerant ofinconveniences; they also require useful results from the system.''

Social and economic implications of CC (Computerized Conferencing) systems are also analyzed in _Network Nation_. Designing a human interface without referencing this book is not recommended. Don't reinvent any wheels, don't subject yourself to comments about your "brain damaged" system, give the users a break - have your library get a copy of this seminal treatise or better yet, get a copy for yourself.

I plan to have an early version of SEIE for demo at the SOUTHNET packet conference.

*FADpad is available in two 2764 EPROMS with your callsign burned in for $20 from Ted Huf, K4NTA, 1829 NW Pinetree Way, Stuart, FL 33494. Also available on 8" CP/M disk from the author, send a diskette with sufficient return postage.

11. Packet equipment from the major packet manufacturers will be on hand for your use and inspection.
12. Xerox 820 hints and kinks, both for use as a computer and as a packet device. The FADpad and digipeater software will be available on site.
13. Workshops for the Commodore Vic-20 and C-64, Apple, and other computers with the emphasis on terminal software and packet interfacing.
14. Emergency communications applications of packet networking.
15. A general meeting of the FADCA membership, and a Directors' meeting.
16. SOUTHNET link planning sessions with bordering state representatives, including discussions of protocol issues.
17. A demonstration of the MacPacket software that is introduced in this issue.

Those are not all the events planned, but enough to show you (I hope) that this is an event not to be missed! Again, if you have some subject you would like to present to those in attendance, there is plenty of time to get on the schedule.

I attended the Fourth ARRL Computer Networking Conference and ARRL Digital Committee Meeting in San Francisco the first weekend in April. The facility and program arrangements made by members of the Pacific Packet Radio Society were excellent. Even the care I received in the hospital when I became ill was done with care and style. If you have to be in a hospital, a ninth floor room with a view of the Golden Gate Bridge is not a bad way to go. The presentations at the conference were very stimulating and I highly recommend you get a copy of the conference proceedings from the ARRL. You can get a great education in packet just by reading that publication. It is always a pleasure to meet and talk with the outstanding members of the various packet communities, and this trip was no exception. The amount of enthusiasm and energy displayed by those in attendance really is refreshing and stimulating.

Heath packet boards are apparently selling very well. I have heard of a number of waiting lists at Heath stores. As new products are introduced to the packet market we should expect continuing rapid growth. Much effort will be required to insure the promise of packet is kept for these new people.

Last month I spent two days at Ft. Walton Beach and was very pleased at the response to my packet talks and demonstrations, and the friendly reception. Considerable activity is springing up in that area and I look forward to visiting there again.

Lots more news, but it is time to go to press. Look for the May BEACON in about 3 weeks. 73.

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
305-723-8659

DIGITAL EVENTS

APRIL 26/28.	Dayton Hamvention.
MAY 4/5.	Albany GA Hamfest with SAPS packet demo.
JUNE 15/16.	SOUTHNET Packet Conference, University of Florida, Gainesville.
JUNE 22/23	ARRL Field Day. Show off those portable packet stations.

MacPacket / TAPRterm

by Jack Brindle, WA4FIB

Packet radio presents many interesting opportunities to its participants. We now have access to many computer bulletin boards where we can leave messages and share programs. The many computer users on the air have used the medium for exchanging computer files and saving QSOs recorded off the air. Those of us using the TAPR TNC with our computers have had to work through the difficult terminal interface built into the TNC. This interface reduces our computers to simple terminals with the power of the computer lost while the user must perform all station keeping to connect, disconnect, or even set the beacon message. The TNC's command list of over 64 commands and parameters does not help the matter, as each one must be learned, and set to properly use the TNC. Many manuals have become worn and dog-eared in the "commands" section. Surely there has to be a better way.

The introduction of the Apple Macintosh computer with its "new" user interface has brought new understanding to the ways information is presented to computer users. The user is no longer saddled with a "text only" presentation scheme, but now is free to use the computer to do his task the way he wants to do it, with information presented in a way that makes using the computer fun! The Macintosh user interface has eliminated the need to memorize long strings of complex commands in order to perform work. Instead, the user simply selects a function, points at it, and "clicks" the selection button! Additionally the renowned graphics abilities of the "Mac" allow information to be presented in a more natural form making interpretation of the data easier. These features make the Mac a natural for controlling ham devices.

It seemed only natural to "marry" the Macintosh with the TAPR TNC. I was was already using the TNC with my Macintosh, running a terminal emulation package called MacTerminal. This package performed quite well as a terminal, but left a lot to be desired when using the TNC. There were several features I desired, such as split screen text display and others described below, that are not available in MacTerminal. Additionally, I still had to memorize the various TNC commands. The answer to the situation was obvious, I needed a terminal package designed for the TAPR board. The result of my development is called MacPacket/TAPRterm.

The first thing the user sees upon executing MacPacket/TAPRterm is a split-screen display with a row of menus across the top of the screen (see figure 1). The screen is divided into two "windows", for receive and send data. All information typed by the user, when not using a menu command, is displayed in the send box. Received text is, of course, displayed in the larger receive window. The receive window is larger to give the user more opportunity to view the data before it scrolls off the screen. The use of split screen eliminates the need for the upper / lower case scheme used by some to differentiate between the two text streams. Both screens make use of the Macintosh TextEdit facility. This means that text may be cut, copied, and pasted between the two screens and the clipboard. This is very useful for resending text just received, or even sending data cut out of other programs such as MacWrite.

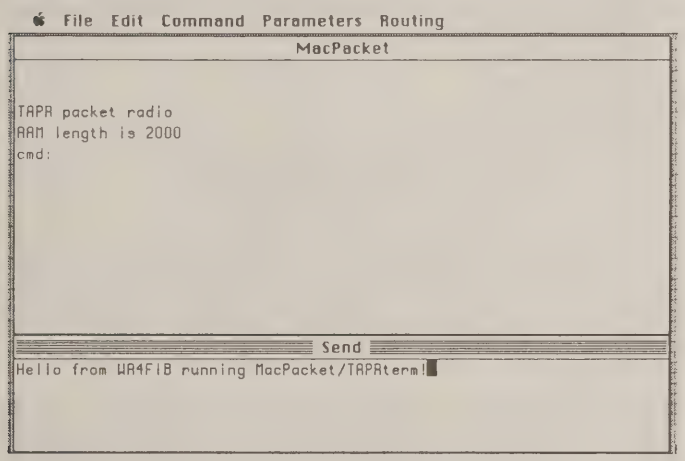


Figure 1: MacPacket/TAPRterm Main Screen

The menu bar contains six menu categories containing commands to control TNC, Macintosh, or TAPRterm functions. The "apple" menu, at the left of the menu bar, contains "desk accessories" for the convenience of the user. Desk accessories consist of small programs to help the user, such as a clock, notepad, and calculator. They may be called up and used at the user's convenience. The next menu contains selections for printing, file send (upload), receive (download), and quitting the program. The print selection simply sends the received data to the printer in addition to the screen. File send and receive allow the user to transfer files to another station. Two modes of transfer are allowed, depending on the destination station. The first is normal text transfer. This would be used in exchanging files with a non-Macintosh station or where normal text is being received or sent. The second format is used to transfer Macintosh binary files. These may consist of MacPaint type drawings, MacWrite formatted files, other Macintosh binary format files, or even Macintosh application programs! This format appends file information to the packets along with a format identifier so that a receiving Macintosh will reconstruct the data in the same form as it exists in the sending station. It should be noted that these files may be stored in any bulletin board that allows binary files. Of course the files would be useless to non-Macintosh computers.

The third column, Edit, contains the familiar editing functions of Cut, Copy, Paste and Clear. These functions are used in transferring text to and from the Macintosh "clipboard" temporary storage area.

The fourth menu category contains the various TNC commands. These commands cause the TNC to perform some task, such as sending the cw id. The commands include: Calibrate (enter TNC calibrate mode), Connect (described below), Converse (enter TNC converse mode), Disconnect, ID (send cw id), Reset (the TNC), and Transparent (enter TNC transparent mode). Calibrate places the TNC in calibrate mode, as described in the TNC manual's hardware section, where the TNC "walks" the user through modem calibration. The Connect selection provides a dialog box (see figure 2) that allows the user to select a station to connect with, set the connection mode (converse or transparent), and select the routing to be used to connect with the desired station. The operator can chose to enter the route calls into the dialog box, or to use pre-stored information in the connect request. The routing information may be used as is, or edited to change, add or eliminate any of the routing calls, in case a station is down or some other path is desired. The dialog box even allows the user to search through the stored routing tables to find a station and route to connect with.

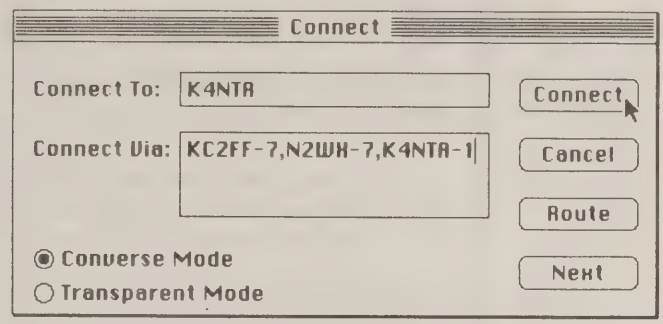


Figure 2: Connect Dialog Box

Routing tables are stored in memory and on disk for up to 100 calls with up to eight relay nodes per call. The information in the tables is edited and modified using the Routing menu. Selecting the edit function under this menu allow the operator to view each entry in the routing table and edit, delete, or add entries in the table. The dialog box uses the same layout as the Connect dialog box, with the addition of file manipulation selections (see figure 3).

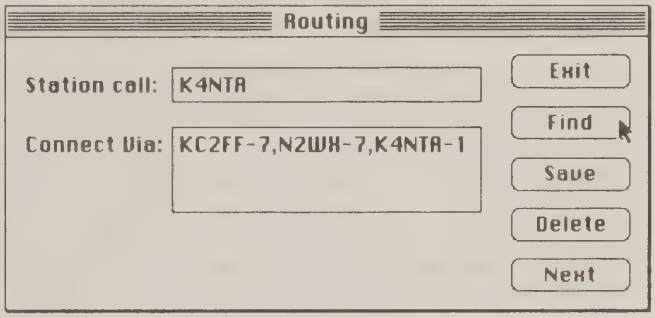


Figure 3: Routing Table Edit Dialog Box

TNC parameters can be viewed and modified using one of the Parameter menu selections. The parameters are divided into seven groups, as defined by the TAPR Display command. The groups are: Character, Id, Link, Monitor, Terminal, Timing, and Trace parameters. Selecting one of the group functions causes the Macintosh to poll the TNC for the parameter information, then display a dialog box showing the data. A typical dialog box, for link parameters, is shown in figure 4.

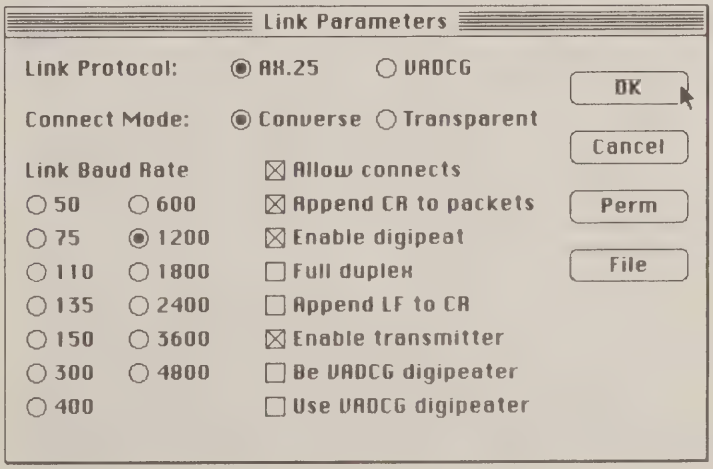


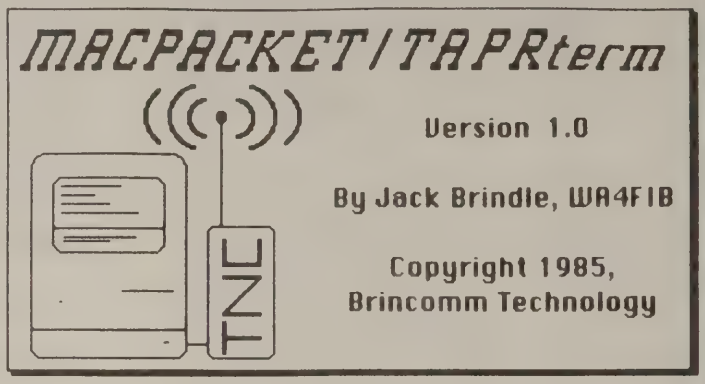
Figure 4: Link Parameters Dialog Box

File Edit Command Parameters Routing

MacPacket

MacPacket/TAPRterm is a "front-end processor" for the Apple Macintosh™ when used with the TAPR Terminal Node Controller.

Features:
- split screen display.
- file upload, download and printing.
- menu selection of tnc. commands and parameters.
- Compatible with AEA, Heath & TAPR tncs.



Send
- routing tables to aid in selection of route to destination station.
- list price of $39.95 includes all updates for one year.
- Shipping June 1!

For more information, contact:
Jack Brindle, WA4FIB
Brincomm Technology
19451 Gulf Blvd #503
Indian Rocks Beach, Fla 33535

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Continued from previous page.

The parameter data is displayed along with simple explanation labels that try to indicate what the parameter actually controls. This also eases the command memorization requirement, by having the computer to perform translation of TAPR's terse parameter names. Not all parameters are displayed in the dialogs, and some are controlled indirectly. For example, the Terminal function allows the size of displayed text to be changed. When one of these selections is made, the program automatically calculates the number of characters that size will permit on a line, and set the TNC's Screenl parameter. Parameters not displayed in any dialog box may be changed "the old-fashioned way," by entering the parameter name and data on the keyboard while in TNC command mode. In fact, any of the commands and parameters may be entered this way, should the user desire not to use the menu functions.

The philosophy behind the program is that the computer should take care of as many TNC functions as possible to allow the operator to use the system without any distractions. As packet radio moves to networking and beyond, this philosophy will become more important with each added layer requiring additional control information. The goal is to eventually allow the amateur to sit down at the computer, request a QSO with another station, and begin communication, exchanging files, or whatever else he desires, without having to address linking or routing issues. This goal is still in the future when packet networks and upper layer protocols have been established. For now, MacPacket/TAPRterm goes a long way to isolating the user from the TAPR TNC.

MacPacket/TAPRterm was developed in compiled Aztec "C". The program thus runs without many delays. The few delays the operator may experience are due to the TNC interface, or Macintosh disk transfers. The TNC interface causes some interesting problems. There is no reliable connect status available through the serial port, so the computer must assume that the TNC is connected. But, a normal control/c may be interpreted as data in transparent mode, so the computer must assume transparent mode and initiate the command sequence for that mode. This causes delays while the sequence is executed, thus each command and parameter request reflects this delay. It would be nice if the TNC notified the computer of a connection in a non-text format or through the DCD serial line. This notification would have to use some control character that would not be transmitted in normal TNC operation.

Program development has been very interesting and educational. I now understand the formidable task others have gone through in developing applications for the Macintosh. The operating system is very nice to use since it provides almost every function one can imagine. The task in developing becomes one of learning how to use the large number of system calls. This information is contained in a large (1200 page) two volume manual. The best way I have found to develop new program areas is to first read about the necessary functions, then try to use them. This is a trial and error approach in that several attempts will be necessary before success is found, but the results are both satisfying and usually elegant.

MacPacket/TAPRterm is currently in beta test here in Florida. It is expected that it will be shipping sometime in May, assuming no further features are added. My thanks to K4GFG, W1BEL, and KA4NOF for their help in pushing me in this project. For more information, contact me over the air (packet) through KC4FF-7, or through the mail at:

Jack Brindle, WA4FIB
Brincomm Technology
11941 Gulf Blvd #503
Indian Rocks Beach, Fla. 33535

THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The SCCs are now in stock for shipment.

W9DVM has a pair of Cushcraft 32-19 boomers that he will donate to any FADCA digipeater committee that wants to have a highly directional coverage. Otherwise the antennas are for sale for $100. Phil LaMarche, (800) 282-8944 weekdays.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

The FADCA modem kit as described in the March BEACON is $8.95 which include shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

CONNECT - The Beginners' Column

Don Deem, KB4LLO

I suppose one of the biggest hurdles to overcome when starting a new hobby, or a new area of a hobby, is the specialized language used. I remember when the transistor invaded the electronics industry in the fifties, I raced out and bought a book on transistor theory and operation and was totally lost, it was written in a foreign language I thought! Then the computer boom, another language. Packet Radio is no exception to this rule. Since Packet Radio is a combination of the amateur's computer and radio hobbies, depending on your previous interest, some of the language may be somewhat familiar to you. Our endeavor here will be to fill in the blanks and answer any questions that you may have.

My intention is to begin with the most common words and abbreviations that are used on the nets and at the hamfests. If you have a word or phrase that you want defined, or that you think would be helpful to us beginners, drop me a line. At some time in the future, when we have what we think is a fairly complete and correct list of words, a dictionary will be prepared. You old-timers will assist by commenting on the definitions I hope.

TNC - (Terminal Node Controller) - A microprocessor based device that handles all the chores involved in sending and receiving data, including breaking the data up into packets, keying and modulating the transmitter, and receiving and demodulating signals from other stations.

PACKET - In the simplest terms, a packet is a chunk of data, broken up by the TNC from the data typed in by the operator. A packet is usually 128 characters in length. The packet of data is transmitted in a frame which made up as follows:

FLAG - A unique bit sequence used to detect frame boundaries. Usually made up of eight bits.

ADDRESS - A field normally specifying the destination address, the source address, and up to eight digipeaters. Usually uses 14 to 21 eight bit words or bytes.

CONTROL - A byte which identifies the frame type. The control field describes the purpose of the packet to the recipient. It identifies packets with functions such as initialization, termination, acknowledgement, or request for retransmission. It may also contain a sequence number, indicating a multi-packet message that must be received in proper order.

DATA - This field contains the actual data typed into the TNC by the operator, to be transmitted. The data packet portion of a frame is optional and need not be present in every frame. Most frames used for link control only do not have a data field. This field is variable from 0 to 255 bytes.

FCS - (Frame Check Sequence) This field is an error detection field and is two bytes in length. The two bytes contain the remainder from a division of the bit pattern of the frame by a known value. The receiving device performs the same division and compares the remainder obtained to the one contained in the FCS. If they are the same, the frame is considered uncorrupted.

FLAG - Same as above.

BIT - A binary digit, the smallest unit of data that is handled in a digital computer.

BYTE - A binary word, usually made up of eight bits. Each alphabetic or numeric character using the ASCII code requires one byte of storage.

NIBBLE - Any number less than eight bits, although in an eight-bit system, a nibble is generally four bits.

TAPR - Tucson Amateur Packet Radio Corporation. The TAPR Board is the Terminal Node Controller (TNC) designed and distributed by TAPR.

FADCA - Florida Amateur Digital Communications Association. If you are reading this Beacon, and are not a member of FADCA, take just a moment of your time right now and fill out an application and a check, send it to Gwyn. You will have done yourself a real favor!

BAUD - A communications measure of serial data transmission rate. Loosely, bits per second if no complex data encoding scheme is used. If a biphase encoding scheme is used for example, the baud rate will be twice the bits per second rate because each bit transmitted contains two data values.

FIELD - An area of a larger record, instruction, or other storage location assigned to a particular class of data (such as the address portion of a packet).

ROM - (Read Only Memory) A fixed memory that cannot be readily rewritten.

RAM - (Random Access Memory) Any type of memory that has both read and write capability.

DIGIPEATER - Generally a dedicated transceiver, TNC, and antenna system, the purpose of which is to help weaker stations to cover greater distances. A digipeater usually has some advantage such as antenna height, or high output power, although any station can be used as a digipeater if the operator so desires.

PROTOCOL - The rules by which the software determines responses to received data, as well as to the user's commands and data.

GRAPES - Georgia Radio Amateur Packet Enthusiasts Society. The Atlanta based Georgia packet group.

SAPS - Southern Amateur Packet Society. South Georgia.

PACKET STATUS REGISTER - (PSR) The official Bi-monthly publication of TAPR.

FADCA BEACON - The official monthly publication of FADCA.

LAN - Local Area Network.

AMICON - AmSat International Computer Network - Packet Radio operation on SSC L1 of AmSat-Oscar 10 to provide networking of ground stations acting as gateways to terrestrial packet-radio networks.

AMRAD - Amateur Radio Research and Development Corporation. A nonprofit organization involved in packet radio development. Washington, DC area.

VADCG - Vancouver Amateur Digital Communications Group. The Canadian packet radio development group.

ARQ - Automatic Repeat Request. An error-control technique in which a sending station, after transmitting a data block, awaits a reply (ACK or NAK) to determine whether to repeat the last block or send the next one.

ACK - The control signal sent to indicate the correct receipt of a transmission block.

NAK - A negative acknowledgment. The opposite of ACK.

ASCII - American National Standard Code for Information Interchange. A code consisting of seven information bits. The ASCII code is used for communication of text between the TNC and the user's terminal. Packet transmissions are considered by the FCC to be ASCII.

That makes 30 definitions for this effort. If you have any additions, questions, or definitions that you would like to have included in a future article, just drop me a line.

Those of you who are constructing your boards, here are a few tips to help you to keep your board error-free:

1. Use an iron of small size with a tip temperature not to exceed 700 degrees.
2. Check each joint carefully to insure that no bridges are formed and that the component is well soldered.
3. Don't overheat the components, remove the heat as soon as you see the solder start to flow into the holes (the solder appears to shrink).
4. Keep the solder joints shiny.
5. Double-check each component prior to mounting it on the board.

Board failures are few and far between, but if your board fails, don't get upset. Most failures are caused by failure to follow the instructions (wrong parts placement) or faulty IC's. Good construction techniques make troubleshooting a great deal easier. The easiest way to find a faulty chip is by replacement. Have one of your packet friends bring his board over and simply change chips one at a time until the failure is resolved. Otherwise, let FADCA know about your problem and we will direct you to someone who can assist you.

Those of you who want to increase your knowledge of Packet Radio, theory and practice, don't forget THE PACKETFEST, June '85. Two whole days of informal discussions, seminars, etc. Look elsewhere in this beacon for more information -- DON'T MISS IT!!

FADCA SQUELCH TALES

BY KEITH O'BRIEN N4ZQ

SECOND THOUGHTS OVER A CUP OF COFFEE... THE GROWING USE OF PERSONAL COMPUTERS IN HOMES, OFFICES, AND EVEN AMATEUR RADIO HAS MADE THE TERM "FLOOPY DISK" A PART OF THE LANGUAGE FOR MANY PEOPLE. PEOPLE WHO WOULDN'T HAVE DREAMED THEY'D BE SPEAKING COMPUTERESE A SHORT TIME AGO.

I FOR ONE WHO FREQUENTLY DOES SPEAK IT, HOWEVER, WONDER WHY FLOPPY DISKS AREN'T VERY FLOPPY, AND WHY THEY'RE CALLED "DISKS" WHEN THEIR SHAPE IS DECIDEDLY SQUARE. HIDDEN JUST BENEATH THE SQUARE PROTECTIVE JACKETS OF THE DISKS - MORE PROPERLY CALLED FLEXIBLE DISKS - IS A "RECORD" FOR STORING COMPUTER INFORMATION IN A CODE OF ONES AND ZEROS. WHY AREN'T THEY CALLED "FLEXIBLE SQUARE RECORDS"?

I ALSO WONDER WHY THE TAPR TNC LEAVES ONE HANGING IN THE CONVERS MODE AFTER A DISCONNECT BY ANOTHER TNC? JUST WHAT CAN YOU DO FROM THERE, EXCEPT SEND UNCONNECTED FRAMES. AND WHILE ON THE SUBJECT OF TNCS, WHY ARE MY TERMINAL PROGRAMS OVER LOADING THE TNC BUFFER. IT APPEARS THAT THE PROGRAM IS NOT SEEING AN X-OFF CHARACTER FROM THE TNC. AND IF IT DOES NOT SEE THE FIRST X-OFF, IT NEVER GETS THE CHANCE TO SEE ANOTHER. BECAUSE IT'S THE ONLY ONE SENT. WHY AREN'T THERE MORE X-OFF SENT?

ENOUGHT OF THE WHYS, BUT CAN'T HELP BUT PONDER IF I'M THE ONLY WHO HAS THE PROBLEM OF WONDERING THESE THINGS. MAYBE I SHOULD STOP DRINKING SO MUCH COFFEE.

DIGIPEATERS SEEM TO BE THE BIG THING IN THE NEWS THIS MONTH. WE'LL START WITH AN UPDATE REPORT ON THE KEY CENTRAL FLORIDA LAKE WALES (KE4PM-1) MACHINE. PLANS ARE IN THE WORKS FOR A RETURN TRIP TO THE SITE AGAIN APRIL 21. ON THE TOWER ARE TWO OTHER 2 METER OPERATIONS, THE LAKE WALES 147.33 VOICE REPEATER AND W4KUM'S RTTY/ASCII MSO ON 145.66. I GUESS CROWDING A THIRD OPERATION ON THE TOP HALF OF THE TOWER IS ASKING A LITTLE TOO MUCH. TO SUM IT UP IN ONE WORD "DESENSE" WOULD DO IT. OF COURSE PLACING THE DIGI ANTENNA ON THE SAME LEVEL OF THE RTTY MSO WASN'T THE BEST OF PLANS. IT WASN'T TO BE THAT WAY, BUT WITH HOIST PROBLEMS MIDWAY THROUGHT THE PROJECT, THAT'S WHERE IT CAME TO REST. THE BOTTOM LINE IS THAT WHEN THE MSO IS UP, THE DIGI IS STONE DEAF! ALSO WE HAVE BEEN GETTING REPORTS THAT WHEN THE MSO IS DOWN, THE DIGI HAS A HEARING PROBLEM FROM ORLANDO. SO WE GOING TO TACKLE THE PROJECT ONCE AGAIN. PLANS ARE TO MOVE THE DIGI ANTENNA UP ANOTHER 60 TO 70 FEET HIGHER, IN HOPES THAT SOME VERTICAL SEPERATION WILL CURE THE DESENSE TROUBLE. THAT WILL LOCATE THE DIGI ANTENNA AT AROUND THE 360 FOOT LEVEL, AND A REORIENTION TO HELP ORLANDO OUT. JIM (K4AHO) HAS BEEN BUSY WORKING ON THE PERMANENT GLB BOARD THE PAST WEEKS, AND HOPES TO HAVE IT INTERFACED WITH A SOLID STATE RIG PROVIDED BY KB4ZS WHEN THE RETURN TRIP IS MADE. THE PENINSULA OF FLORIDA IS NOT BLESSED WITH TOO MANY HIGH SITES, AND THE LAKE WALES TOWER LOCATION IS ON SOME OF THE TALLEST AROUND. IT'S A SUPER LOCATION FOR A DIGI, AND AN ALL OUT EFFORT WILL BE MADE TO GET IT WORKING.

CLEARWATER'S KC2FF-7 HAS RETURNED TO THE AIR THIS WEEK, BIGGER AND BETTER THAN EVER. IT TOO WAS HAVING A HEARING PROBLEM, BUT WAS TRACKED DOWN TO A BAD SOCKET IN THE MODEM CHIP ON THE TAPR TNC. FF-7 ALWAYS DID PUT OUT A FINE SIGNAL, BUT ONLY A FEW WERE ABLE TO GET BACK INTO IT. IT'S BACK IN OPERATION WITH A GLB TNC, A ICOM 27H AND A 160 WATT KICKER.

SORRY TO HEAR THAT FT. LAUDERDALE'S DIGI W4LDP-1 WILL NOT BE RETURNING TO THE AIR. NOT SURE WHAT WILL BE THE REPLACEMENT, BUT CONTINUE TO USE WA1JOU IN IT'S PLACE.

WB4RCY-1 IN JACKSONVILLE, IS ON THE MOVE AGAIN. UNDERSATAND ANOTHER SITE IS TO BE TRIED AND MAYBE WITH MORE POWER. THAT WOULD BE A BIG HELP IN SECURING A MORE RELIABLE CONNECTION TO SOUTH GEORGIA KF4JF. RCY-1 HAS BEEN MOVED SO MUCH, IT MUST HAVE WHEELS ON IT.

GAINESVILLE'S DIGI KF4TT-1 USUALLY HAS A PATH TO KF4JF IN GEORGIA EVERY NIGHT. ONE EVENING WE HAD A ONE HOP SHOT INTO KF4JF'S BBS. ENJOYED THE USE OF THE SYSTEM, LARRY, AND REALLY LIKE THE EASE OF PUTTING MESSAGES IN. NOT A WHOLE LOT OF TIME SPENT ASKING QUESTIONS AND GIVING PROMPTS TO DO IT. LARRY IS RUNNING W0RLI BBS SOFTWARE VERSION 8.8, ON A XEROX 820 SYSTEM.

THAT'S ALL THE TIME AND SPACE FOR THIS MONTH. PLUS IT'S TIME FOR ANOTHER CUP. I WONDER WHY THE DIGI ARE HAVING SO MUCH TROUBLE LATELY....

$49...KEITH

Subj : Ocala Digipeater

K4OZS/R at new temporary location - 130ft, 150W, 2-14 element, pointed to Orlando/Melbourne with good signal to KF4TT-1 in Gainesville. Please give it a try and tell WD4PQN or WB4EXN your comments. TNX es 73, Larry

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

Much has been said about FADCA's GATOR Link Network. In case some readers have not heard, GATOR 1 will link the two meter digipeaters on 220 mHz at 9600 baud.

Here is an update of where we stand now. Larry, K4OZS, has wire wrapped two of the 9600 modems designed by Steve Goode. Tom K4GFG and Ron WA1JOU will conduct on the air tests with them on 220. If all goes well, the tests will be completed during May. TAPR says that they are committed to produce these modems boards so it should not be long until there are ample quanities of modems for our GATOR 1 Network. If TAPR is delayed in production of the boards, FADCA stands ready to make a limited quanity run of them.

Howie, N2WX is well on the way to having the GATOR 1 software ready. While this system will not be ISO Level 3, it will do what we need GATOR 1 to do, namely link the digipeaters at high speed to reduce QRM on 145.01. Howie will no doubt have the software completed about the time the modems are ready.

The 1200 baud modem board for the two meter side of the network has been designed by Jerry, N4AJH, for FADCA. This modem board can also be used for HF packet with a TAPR board and is available direct from Jerry (See notice elsewhere in this issue).

The Xerox 820 single board computer and the FAD board rounds out the GATOR 1 node equipment. Howie designed the FAD board last summer to interface with the 820. It contains a Z-8530A SCC chip to make the packets. The bare FAD Board if available from TAPR and FADCA has the Z-8520A chips for $20. Using the FAD board with the 820 is old hat. I have been using the 820, FAD board and one of Jerry's modems for months here as K4NTA-2. The TNC software used for K4NTA-2, called FADpad, is now avaiable. Look for news about it in Howie's column in this issue.

The FADCA Chapters in Broward and Palm Beach counties are well on their way to having the equipment rounded up to put GATOR 1 Network stations on the air. Here in Stuart, I have the some of the equipment but the main part missing is the 220 radio. I am building up the computer part of the station for Jacksonville. Howie's Melbourne digipeater will be converted in short order. As soon as the first link is put in, I am sure that the other LAN's will rush to get GATOR 1 Network stations on the air to link their digipeaters into GATOR 1.

A proposed frequency plan is elsewhere in this issue of the BEACON. Please comment as soon as possible if you see any problems with it. I already know of one problem in Orlando.

We should be able to show a working lashup of two GATOR 1 nodes at the Southnet Packet Radio Conference (Packetfest) in Gainesville, June 15-16. See you there.

PROPOSED GATOR-1 FREQUENCY PLAN

Ted Huf, K4NTA

With our present system of digipeaters all operating on the same frequency, 145.010, we have what I will call self interference. This happens when two or more digipeaters hear one another and either QRM each other or cause one to hold off from transmitting because it hears the carrier of the other. As you know, because we have no way of linking the digipeaters together on another frequency, this is the only way we can communicate past our local digipeaters. This self interference causes retries, which cause more retries until only the stations very close to each other can communicate or until some of the TNC's retry out. This problem is especially bad if there is a BBS in use.

The idea for GATOR 1 is to link the digipeaters on 220 mHz at 9600 baud. The 220 linking frequency will be reserved for linking stations and use a protocol that will provide for acknowledgements between link stations.

Each GATOR 1 link station will be assigned a two meter frequency based on a proposed frequency coordination plan that this article will discuss. For example,

Continued on next page.

lets assign two meter frequency A to Miami, B to Ft. Lauderdale, C to West Palm Beach and D to Stuart. If a Miami station was downloading a file from a BBS in Stuart, frequency A and D would be busy, but frequency B and C would be QRM free. Also the digipeaters in Stuart and Miami would not hear each other as they do now. The relay between Stuart and Miami would be on 220 at 9600 baud. The results would be much faster throughput with no interference to the areas between Stuart and Miami.

This proposed plan uses four frequencies and provides 100 miles separation between GATOR 1 digipeaters operating on the same frequency. In some cases 100 miles may not be enough to prevent self interference. For these cases, if it becomes a problem, perhaps something like an anti-subaudible tone decoder gated to the carrier detect line would prevent the hold off problem.

I have not used 145.010 in this frequency plan and propose that it continue to be used for simplex and digipeaters not tied into the GATOR 1 network.

Greater separation could be obtained with another two meter frequency but in order to stay between 145.000 and 145.100, we would have to use 15 kHz spacing. Comments and suggestions are requested on this plan and the use of five 15 kHz channels.

Keywest	145.050	Orlando	145.090
Homestead	145.030	Ocala	145.070
Miami	145.090	Daytona	145.050
Fl. Lauderdale	145.070	Gainesville	145.090
West Palm Bch	145.050	Jacksonville	145.030
Stuart	145.090	Waycross Ga	145.070
Okeechobee	145.030	Valdosta Ga	145.090
Naples	145.090	Tallahassee	145.050
Ft. Myers	145.070	Albany GA	145.070
Tampa/St Pete	145.030	Panama City	145.090
Lake Wales	145.050	Ft Walton Bch	145.030
Melbourne	145.070	Pensacola	145.050

Msg : 3643 Sec. 0 - ROUTINE
Date : 04/17/85 06:20:15
To : K4NTA (X) (R)
From : K4GFG
Subj : 144 MHZ BANDPLAN

Ted, have you have noticed in the Westnet file that they have chosen redundancy over efficiency and elected to keep all digis on 145.010, even when their backbone on 220 is in place? This may have some merit for FADCA as well. The redundancy theme was also suggested by one of the fellows down this way.
Here's a thought...we might delay moving a digi off 145.010 until a second digi which can span the same 220 links in the area joins the backbone. It would then be assigned a different 145 frequency, per your bandplan. Taking this a step further, we could simply say that the first digi in each community gets 145.010, the second to sign on gets 145.030, the third gets 145.050...etc. Any digis not on the 220 backbone will be assigned 145.010. This might make for a very orderly assignment method for expansion. When loading gets heavy in a region, they can set up a second digi on 145.030 on the backbone. I think we overestimate the need for frequency re-use.

Msg : 3659 Sec. 0 - ROUTINE
Date : 04/17/85 19:38:28
To : K4GFG (X)
From : K4NTA
Subj : 144 MHZ BANDPLAN (Ref: # 3643)

Your idea has merit and will require more thought. I sort of figured that just because two town were able to link up on 220 would not mean that they would QSY. For example if WPB and FtL were the first two to link, and if say WPBmoved to 03 and FtL to 05, what would Stuart and Miami do? It would seem that the linking would have to be pretty much complete before and QSYing was done.

To: All
From: Pete WB9FLW
Subject: Packet Radio Applications

TAPR & the ARRL are joining together to produce a new PACKET RADIO PRIMER videotape. The production will be done in the studios of KSD-TV the NBC affiliate in St. Louis. The new production will lead the newcomer through the basics ofcourse, but it was felt that examples of practical Amateur & non amateurapplications would help make the tape more entertaining and imformative. Sowhat ya say gang, lets hear about your favorite Packet Radio Applications, itmight help to convince someone to join the fun!

EXCERPTS FROM OTHER PUBLICATIONS

THE FOLLOWING COMES FROM DRNET
M 23275 Steve Goode (K9NG,2981) 3/18/85 7:22 PM L:16
KEYS:/CAPRA LEVEL 3 LINKING/
TO: (Group 95)

The second meeting of the CAPRA Level 3 networking committee took place on Wednesday evening, March 13th, at the home of WD9DBJ. By the end of a rather animated 2 1/2 hour meeting, it had been agreed to set a target date of May 1st for installation of the 220 Mhz 9600 Baud link between Chicago and a tower located near the intersection of Indiana State Route 421 and I80 in Otis,Indiana. Two Xerox 820 Micro-computers, one at each end of the link, would be used to test out the link while development of the network software continues.

Also, the group generally agreed to use a slightly modified TCP/IP as a networking protocol. W9TD requested that committee members volunteer to do intensive research on areas of special interest prior to the next meeting,which has been scheduled for April 18th. Those areas of interest include the problems associated with development of a user interface to the network and determination of what modifications of TCP/IP might be necessary to make it suitable for packet radio networking.

The second WESTNET meeting was held as the last Saturday night session of the packet radio meeting in San Francisco. The following groups were represented: Los Angeles Area Packet Radio Group (LAPG), Oregon Packet Radio Association (OPRA), Pacific Packet Radio Society (PPRS), Rocky Mountain Packet Radio Association (RMPRA), Southern California Digital Communications Council (SCDCC), San Diego Packet Group (SDPG), Tucson Amateur Packet Radio (TAPR).

The purpose of the meeting was to gather those amateurs with software, digital hardware, RF hardware, and mountain-top expertise and who share the common goal of improving and extending the west coast packet radio network to determine the next steps toward reaching that goal.

Packet has experienced a 660% increase in California since the first WESTNET meeting. We are now ready to proceed with the first in a series of improvements, the installation of a 9600 baud backbone.

The same WESTNET philosophy holds for this round of updates, i.e., don't wait on the next innovation which is coming "real soon now", make due with what we have and get something running before the snow falls above 5000 feet. At the same time, don't build anything that will make transfer to the next level of technology difficult.

In the spring of 1985, the amateur community still hasn't defined a networking layer protocol. This should be no great surprise, since the commercial world has been arguing about it far longer than we have. We don't have any running prototypes, either. What we do have is a 9600 baud modem design, the ARRL Lab's n-port digipeater software, nearly 350 users in the current WESTNET area running 1200 baud on two meters, and a chain of 7 digipeaters with frequency translation between southern California on 145.36 and northern California at 145.01.

The first step toward improving this situation was to change the southern California bandplan to add the national packet radio frequency 145.01 MHz and get it coordinated for packet radio digipeaters. This was done by a vote of the membership of the Two Meter Area Spectrum Management Association of Southern California (TASMA in late March.

Phase I of WESTNET '85, agreed to at this meeting, is to install 145.01 digipeaters in southern California. This will remove the need to perform frequency translation in Santa Barbaraand will reduce the maximum number of hops to five, with only three hops required to link San Francisco to LA. An immediate improvement in network service will result.

Phase II is to install n-port digipeaters, 220 MHz radios, and 9600 baud modems at each of the digipeater sites. Each digipeater will be linked to its neighbors at the higher baud rate and frequency, and will provide user access to that link via 145.01 MHz at 1200 baud.

Continued on next page.

This will avoid collisions between local traffic around each digipeater and the traffic passing through the digipeater on its way to a more distant point. While not as good as a true network protocol, this will provide vastly improved service over that which is currently available. An appendix to this report will describe the benefits in greater detail, as well as describing the n-port digipeater that makes it possible.

Since the n-port digipeater is implemented on surplus Xerox 820 boards, WESTNET can switch to a true layer three network when one becomes available. The Xerox 820 was designated as he target hardware for the first prototype layer three network software at the ARRL Digital Committee meeting in 1984.

Once in place, WESTNET will allow a user to use the network as if it where a simple chain of digipeaters. He will transmit and receive on 145.01 MHz. If he specifies more than one digipeater in the connect path, his packet will be repeated between digipeaters at 9600 baud on 220 MHz. The packet will be transmitted on 145.01 MHz by the last digipeater in the list. Standard digipeaers can be used on 145.01 as far as necessary in the event a user can not directly access an n-port digipeater site.

It is expected that by the WESTNET '86 meeting, and certainly by WESTNET '87, there will be a true network layer protocol in place, a large number of users and most host/mailbox systems will access the network directly at 9600 baud on 220 MHz, and that the backbone network will be on 1.2 GHz at 56K bps. We also suspect that the 145.01 network access and digipeat capability will always be needed; to handle entry level users, as a redundant path for network failure and resiliency in case of emergency, and to handle users in extreme outlying areas where the number of users and traffic loads do not justify high bandwidth equipment.

The following items were specifically agreed to at this meeting:

The primary two meter input to WESTNET will be 145.01 MHz, using the current Bell 202 1200 baud standard. Other two meter operations can also link in on the 220 MHZ requency, e.g. the 146.745/.145 duplex repeater in southern California, so long as only those packets intended for the link are passed to the link.

The 220 MHz link frequency is 220.950 MHz.

The 220 modem standard is the K9NG 9600 baud modem.

The controller to be used is the Xerox 820, running the ARRL Lab's n-port digipeater code.

We will publish details of how this all comes out as soon as we can, including details of 220 rig modification, software mods to the n-port digipeater code, state machine PC boards for the 820, etc. Until then, please go to the original source for details. The n-port code is available from Jon Bloom at ARRL HQ. Details of the K9NG modem are available in the Proceedings of the 4th Annual ARRL Computer Networking Conference, available through the ARRL. TAPR will be distributing PC boards for the modem in the future.

Harold Price, NK6K

To: Paul Rinaldo, W4RI, American Radio Relay League
From: H. S. Magnuski, KA6M
Date: March 30th, 1985

At the meeting of the Board of Directors of the Pacific Packet Radio Society on March 21st, 1985, the following resolution was passed:

Whereas the Pacific Packet Radio Society was one of the first societies formed specifically to encourage the growth of computer networking via radio using all digital concepts and techniques, and whereas the San Francisco area was the site of the nation's first amateur digipeater, and whereas an even greater challenge faces the amateur radio community to establish a transcontinental link, the Pacific Packet Radio Society has decided to establish a unique award to encourage the completion of the first terrestrial transcontinental network link. This one-time award shall be known as the "Golden Packet" award, and the regulations relating to it are listed below:

1. A transcontinental link must be established, with each terminus located within 100 kilometers of either the Atlantic or Pacific Ocean.

2. The system must consist of fixed terrestrial digital store-and-forward radio links using VHF (greater than 144.1 MHz.), UHF or microwave frequencies. Use of HF, satellite, tropo, metscat or moonbounce channels is prohibited.

3. A valid two-way transmission and acknowledgement of previously unknown information (256 characters or more) must occur in real time (less than ten minutes).

4. This competition is open only to validly licensed North American amateurs, and no commercial links or services may be utilized in the path. Club stations are permitted.

5. Proof of the exchange must be adequately documented and submitted to the PPRS. Proof must include a list of the stations in the link, their locations, frequencies used, and a copy of the text exchanged.

6. The reward shall consist of a suitably engraved plaque with the names of all participating stations listed which shall be presented to the ARRL. Each participating station shall receive either a plaque or a certificate.

7. Final decision on the award is subject to review and approval by the Board of Directors of the Pacific Packet Radio Society.

Respectfully submitted,
H. S. Magnuski, KA6M
Pacific Packet Radio Society
P. O. Box 51562
Palo Alto, CA 94303

PERSPECTIVE

By Harold Winard, KB2M
(reprinted from SATELLITE JOURNAL)

In Russian parlance, a troika consists of three horses, usually hitched to a carriage or wagon and all pulling in the same direction. More recently, the word has been used to describe a council of three leaders, all of whom are required to pull the ship of state in the same direction at the same time. The troika, as a form of leadership at the top levels of Soviet government, has not been successful. One person usually emerges from among the three to take hold of the reins of government. However, leadership by council has been somewhat more successful in other parts of the world, where conformity of opinion is not a prerequisite for membership to the governing body. And despite jokes to the contrary, a committee can indeed take a constructive rather than obstructive role in the affairs of state or, for that matter, the affairs of an organization of any size. If all members of a committee needn't be of like mind to be productive, what is the glue that holds the committee together and the catalyst that prompts it towards action? The glue is commitment and the catalyst, a clearly defined goal.

Every few years in amateur radio, a new technology or mode of operation comes along that requires hams to band together into groups to solve mutual problems. The American Relay League was the result of just such a need and repeater councils are a more recent example of the desirability of concerted efforts by individuals within the framework of an organization. A new technology has forced the amateur community to again think about the need for formal organization. Packet radio, once the plaything of self-described "bearded experimenters," is now a thriving branch of our varied avocation and one that promises to bring us many benefits. One of the first will be PACSAT, an orbiting digital mailbox that will store and forward messages to radio amateurs all over the world. Hams in sparsely populated areas will have no difficulty sending a message to the satellite as it makes one of several passes each day. However, hams living in heavily populated areas will have a problem. Everyone will want to send and receive messages during convenient times and many may not have the equipment or know-how to set up a fully automatic station. A practical solution to the problem appears to be the gateway station. A radio amateur would prepare a message for a distant friend and send it to a regional gateway station for storage and subsequent transmittal to PACSAT during one of itrs several daily passes. It will be able to send messages in an orderly, serial fashion, one after the other, allowing everyone's message to be received and stored without interference.

Continued on next page.

The gateway station makes eminent good sense but it does pose some problems. Like all forms of communication, packet radio requires a set of protocols that extend beyond merely the equipment, software, and communication conventions. In order for people to communicate via packet, especially over very long distances, the amateur community must come to grips with not only what networking scheme to use, but also who will pay for it, who will install it, and who will maintain it. Unlike FM Repeaters, which can be installed by an individual or a club for the benefit of many, a packet radio network is beyond the financial capabilities of the lone ham or even a small group. To stretch data from coast to coast, or even several hundreds of miles across barren terrain demands the expertise of the RF expert, the money of a substantial organization, and the unanimity of all concerned. As a link from one point to another, a gateway station or network controller must be reliable and have the sustaining support of a group large enough to ensure continuity.

With the start of PACSAT development near, now may be the best time to start thinking about how packet activity to the satellite will be handled. It's quite obviously a problem beyond the scope of an individual and requires radio amateurs to once again band together to pool financial and technical resources. The committies and councils formed for the purpose should have a clear understanding of the importance of their work, the short time left to accomplish it, and the absolute need for cooperation, both on the local and regional levels, and also on the national scene. To prepare for the arrival of spaceborne communications, perhaps the newly formed packet committees should undertake a study of how terrestrial communications can be improved. How wide an area should each committee encompass? Who should deal with the interconnect needs of packet committees in adjacent geographic areas? What types of networks should be established and who should be required to pay for the equipment? Those are some of the questions that face the new committees but they are certainly not all.

Some of the stickiest problems will be those that others before have had to deal with, albeit in a different context. For example, can an amateur radio group be truly democratic? That is, should the majority rule on questions of standards and protocols or should such matters be totally within the province of the technical and operations leaders? If money is collected, how should it be spent and for whose benefit? If a digipeater is built, should it be on 220 MHz where it would help populate an as yet underused band, or should it be available to the larger group of users on the 2-meter band? As you can see, there are many problems to think about and many solutions to be found. Before amateur radio embarks on this grand project to connect the world with digital communications, shouldn't we all think a bit about what directions we should take here on the ground? Like the troika, packet committees will have to pull together in one direction to accomplish their goals.

NON - ELECTRONIC MAIL

Hello Gwyn,

Hope this is in time for the newsletter. Please put an announcement about the Albany, Ga. hamfest on May 4 and 5th. We are planning a packet meeting during the hamfest. Also an update on SAPS "Southern Amateur Packet Society", the hardware is in place for the Adel high site is in place. We are waiting on the fella who is to climb the tower. This site will be approximatly 900 ft. We are still seeking written permission for Waycross and several other possible sites. Due to the intense work going into the Adel site, we have not had the time to get a Xerox board going with N2WX software. We also haven't got the modem built yet. As far as the Macon digipeater, WB4GQX has removed the TNC (WB4GQX-2) from the test site. He is looking for another test site and hopefully we can have something going real soon.

Now for some exciting news. I made history again on March 31, Sunday night, when I connected and talked with a Florence S.C. station. "Direct with Band Cooperation". I connected with WD4KFD, Charlie, through W4ULH digipeter. I then connected with WA4SZK, Don, who has an HF to 145.01 Gateway. WD4EDT & K4WMT are also on there. They were not aware of anyone on in Georgia. They are working on link to N.C. which is linked to D.C. area. Charlie said they would be looking south too, since they know N. Georgia is on packet. Who knows, with 3 or 4 key high sites, Southnet Packet Network extension to Eastnet could become a reality!!

Gwyn, I make a suggestion that would allow all packet operators help get more stations on the air and especially in key areas. When on voice repeaters or HF, talk about packet and the network being established. When someone talks computer, bring up packet. Also, think of friends you have met on radio who like computers. Contact them and inform them how packet and computer go hand in hand. I know it will bring people in who have heard, but not pursued this mode. I know of several stations involved and several TNC's ordered because of me telling them about packet. I encourage every packeteer to look at the map and think of hams interested in computers in all areas, but especially areas with no activity or areas where a key digi would be good and then contact that friend.

73 & God Bless, Wayne Harrell

P.S. We will be needing sources for cheap crystal 2-meter gear for other sites when they become available. A Eufaula, Ala. group has contacted us and I sent the introductory video tape. We will do a demo when they are ready. They have an 820 board someone donated for a digipeater, they don't have a TNC there yet.

FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

NAME:_____ CALLSIGN:_____

STREET
ADDRESS:_____

CITY:_____ STATE:_____ ZIP:_____

HOME
TELEPHONE: (_____) _____ - _____

WORK
TELEPHONE: (_____) _____ - _____

ARE YOU NOW OPERATING: PACKET? AMTOR: RTTY: OTHER SPECIALIZED MODES?

WHAT EQUIPMENT ARE YOU USING: _____

FADCA>BEACON

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association (FADCA), 812 Childers Loop, Brandon, FL 33511.

Publisher and Editor - Gwyn Reedy, W1BEL
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...And lots of help from many others. Thanks!!

FADCA is a non-profit organization devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO	Dave Frey, K3AAX
Ted Huf, K4NTA	Dick Klein, W4PCM
Tom Kneisel, K4GFG	Gwyn Reedy, W1BEL
Bill Sams, KF4LG	Bill Whitaker, WD4JKM

Officers:
President - Gwyn Reedy, W1BEL
Executive Vice President - Ted Huf, K4NTA
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Treasurer - Steve Crowley, N4AIY

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (4 ounces) 8 1/2 by 11 inch envelope to the FADCA address.To join, complete the membership application enclosed and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple
Half page	$17.00	issue contracts.
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a guaranteed monthly circulation of 250 copies, however that amount is normally doubled by introductory mailings and distribution at hamfests and demonstrations. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed:

January 1985	- 500	March 1985	-1000
February 1985	- 540	April 1985	- 500

The deadline for inputs for the MAY issue of the FADCA > BEACON is May 10th. Articles should be in final form using a 55 character column width.

FADCA sponsors the SOUTHNET packet network.

THE FLORIDA AMATEUR
DIGITAL COMMUNICATIONS ASSOCIATION
812 Childers Loop
Brandon, FL 33511

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 4 Brandon, Florida April 1985

NEWS AND VIEWS

Gwyn Reedy, W1BEL

FADCA is on the move. Membership is at the 200 mark despite the procrastination of some members to renew for 1985. The current rate of growth will see us to the 300 mark by year's end. Packet activity is getting started in several new areas of the state: Daytona Beach, Tallahassee, Panama City, Ft. Walton Beach, and Pensacola. New callsigns pop up on the screen faster than they can be transcribed to the SOUTHNET master map. Linking efforts are coming to fruition soon, with GATOR 1 likely to be in test operation by June. Also in June is the SOUTHNET Packet Conference. We informally call it the Packetfest, and the things planned for it make it more exciting all the time.

Make your plans now to attend the SOUTHNET Packet Conference. It will be held at the University of Florida student union building on June 15 and 16. The Gainesville location was picked to be a bit more convenient to the Georgia, Florida Panhandle, and Alabama attendees. By the way, the event was named for SOUTHNET instead of FADCA because we want everyone in the Southeast (and from everywhere) to feel welcome.

Rooms are available in the union. A single is $27 per night, two persons $31, and rollaways are $3 additional. There are many variations in bed sizes and room sizes. Please contact the Guest Desk to make a reservation: (904) 392-1607 or Write to J. Wayne Reitz Union, U of F, Gainesville, FL 32611. All the student union rooms are being held for us till June 1st, but you should make your reservation early. Next month's BEACON will carry a list of motels in the area for those that care to stay off the campus. Many persons are planning to arrive on Friday afternoon, and an informal meeting will be arranged at a local eatery that evening.

The official program begins Saturday morning at 9 AM. Informality marks the entire event, and it will not be at all stuffy or boring. There will be a number of events and seminars going on simultaneously to appeal to everyone's tastes. We have ten rooms and the auditorium reserved for both Saturday and Sunday. Scheduled events will run until 5 PM Saturday, with a banquet or dinner starting about 6:30 PM. The early dinner will perhaps appeal to those visiting for the day only. Sunday the program will run from 9 AM to 3 PM to allow return travel.

The following list of events will take place at the packetfest. Additional items are being added regularly, and if you would like to present a talk or demonstration on any subject, please contact me for scheduling.

1. A workshop full of test equipment for testing digital and RF equipment, building cables and testing interfaces, etc.
2. Mike Baker, WA4HFR, will present a talk on digitized imagery .
3. Chris Ward will present a talk on the military applications of packet radio.
4. A tour of the Gator Amateur Radio Club Station. Bring your ham ticket so you can operate.
5. Satellite operation with emphasis on packet communication.
6. Packet radio in the CP/M environment by Bernie Mans, AA4CG.
7. Introduction to the WORLI Mailbox system.
8. Introduction to networking protocols. The International Standards Organization layers of networking will be explained.
9. FADCA's Gator 1 network linking hardware and software will be demonstrated, including the K9NG 9600 baud adaptions of the Hamtronics FM-5 transceiver.
10. Howie Goldstein, N2WX, will present a seminar on his new electronic conferencing system that is mentioned in his article in this issue.

Continued on next page.

THE HOMEBREWED FRAME

Howard Goldstein N2WX, 681 Cardinal St SE
Palm Bay FL 32907-4116
<via compuserve 75006,702 / 2987%NJIT-EIES >

It's been a long time coming - FADCA is now shipping FADpad software for the Xerox 820 and FAD board*. ``Whatsa FADpad?'' Thought you'd never ask. FADpad is:

o - a TNC fully compatible with the AX.25 Level 2 Version 2.0 protocol specification (October 1984) with automatic recognition of connections with older non-version 2.0 code,

o - uses tried and proven TAPR command set and user interface for flexibility, familiarity, and power,

o - supports full duplex connections at data rates up to 9600 baud,

o - written in assembly language for compactness and speed (about 12K object)

o - available in EPROM form (2 2764's plus mods for the Xerox board) -OR- in a ready-to-run .COM file on an 8" CP/M diskette.

This software's been under development since late September 1984, and incorporates suggestions from myriad centers of packet activity around the country. See * for ordering information. (Special thanks go to: Paul Newland AD7I and Harold Price NK6K for their MANY fine suggestions without which FADpad would be difficult if not impossible to use. And also thanks to Bill Newkirk WB9IVR who back in 1983 convinced me that synchronous was the only way to fly those frames).

SEIE is the Systek Electronic Information Exchange which I was asked to comment on in this space in spite of it still being under development. Modelled on the New Jersey Institute of Technology EIES(tm) system, SEIE attempts to duplicate that user interface on a CP/M (2.x or 3.x) system. For a fairly complete description of the interface, and for justification of the EIES interface, see _The Network Nation/Human Communications via Computer_ (Hiltz, Starr Roxanne and Turoff, Murray, 1978). Dr's Hiltz and Turoff researched and documented most areas of difficulty USERS experience in computer communications systems and offer up suggestions to designers to help get around them. Some excerpts:

``Specific Short Items of Wisdom:
o-The most efficient structures for computers are not necessarily efficient for users....

Continued on next page.

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SOUTHNET

WIDE-AREA DIGIPEATERS

ATLANTA:	WB4GQX-1,	JACKSONVILLE:	WB4RCY-1
(146.13/73)	KD4NC-1	MELBOURNE:	N2WX-7
SO. GEORGIA:	KF4JF-1	STUART:	K4NTA-1
GAINESVILLE:	KF4TT-1	OKEECHOBEE:	WA4IYY-1
OCALA:	K4OZS	W. PALM BEACH:	WA4ARE-1
ORLANDO:	N4JWX	HOLLYWOOD:	WA4WHD-1
LAKE WALES:	KE4PM-1	FT LAUDERDALE:	WA1JOU
TAMPA:	W1BEL	MIAMI:	W4NVU
CLEARWATER:	KC2FF-7		

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 0800 EST. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 1930 EST. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 2000 EST. NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 2000 EST. NCS: K4GFG
CRESTVIEW (Panhandle): 147.360 (+600) Sunday at 2030 CST (after traffic net). NCS: K3NN
GAINESVILLE: 146.91 (-600) Monday at 8PM.

SOUTHNET statewide frequencies (Florida)

Primary LAN and calling freq:	145.010
Local QSOs & file xfers:	145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):	221.720, 221.780
Narrow bandwidth linking:	221.400 (20 KHz b/w)
Medium bandwidth linking :	220.570 (100 KHz b/w)

SOUTHNET MESSAGE HANDLING SYSTEMS (Mailbox/BBS/MSO)

SOUTH GEORGIA: WB4ZNW, KF4JF (W0RLI Mailboxes)
ORLANDO: WB4TRJ
STUART: K4NTA, WD4KAV
WEST PALM BEACH: WD4LHF
MIAMI: NK4K

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM, N2WX [75006,702], K4GFG
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL

THE HOMEBREWED FRAME Continued

o-Effectiveness of an interface design is measured by the extent to which the user can forget there is an interface...
o-There is not much new in interface design, but a lot of rediscovery goes on...
o-In science, theory leads experiment; in interface design the opposite is true...
o-Users will evaluate systems in their terms, not in computer terms...
o-A system that does not evolve begins to die...
o-What you can count on for at least some users is that they are highly intelligent, too busy for any training course, very impatient, and intolerant ofinconveniences; they also require useful results from the system.''

Social and economic implications of CC (Computerized Conferencing) systems are also analyzed in _Network Nation_. Designing a human interface without referencing this book is not recommended. Don't reinvent any wheels, don't subject yourself to comments about your "brain damaged" system, give the users a break - have your library get a copy of this seminal treatise or better yet, get a copy for yourself.

I plan to have an early version of SEIE for demo at the SOUTHNET packet conference.

*FADpad is available in two 2764 EPROMS with your callsign burned in for $20 from Ted Huf, K4NTA, 1829 NW Pinetree Way, Stuart, FL 33494. Also available on 8" CP/M disk from the author, send a diskette with sufficient return postage.

11. Packet equipment from the major packet manufacturers will be on hand for your use and inspection.
12. Xerox 820 hints and kinks, both for use as a computer and as a packet device. The FADpad and digipeater software will be available on site.
13. Workshops for the Commodore Vic-20 and C-64, Apple, and other computers with the emphasis on terminal software and packet interfacing.
14. Emergency communications applications of packet networking.
15. A general meeting of the FADCA membership, and a Directors' meeting.
16. SOUTHNET link planning sessions with bordering state representatives, including discussions of protocol issues.
17. A demonstration of the MacPacket software that is introduced in this issue.

Those are not all the events planned, but enough to show you (I hope) that this is an event not to be missed! Again, if you have some subject you would like to present to those in attendance, there is plenty of time to get on the schedule.

I attended the Fourth ARRL Computer Networking Conference and ARRL Digital Committee Meeting in San Francisco the first weekend in April. The facility and program arrangements made by members of the Pacific Packet Radio Society were excellent. Even the care I received in the hospital when I became ill was done with care and style. If you have to be in a hospital, a ninth floor room with a view of the Golden Gate Bridge is not a bad way to go. The presentations at the conference were very stimulating and I highly recommend you get a copy of the conference proceedings from the ARRL. You can get a great education in packet just by reading that publication. It is always a pleasure to meet and talk with the outstanding members of the various packet communities, and this trip was no exception. The amount of enthusiasm and energy displayed by those in attendance really is refreshing and stimulating.

Heath packet boards are apparently selling very well. I have heard of a number of waiting lists at Heath stores. As new products are introduced to the packet market we should expect continuing rapid growth. Much effort will be required to insure the promise of packet is kept for these new people.

Last month I spent two days at Ft. Walton Beach and was very pleased at the response to my packet talks and demonstrations, and the friendly reception. Considerable activity is springing up in that area and I look forward to visiting there again.

Lots more news, but it is time to go to press. Look for the May BEACON in about 3 weeks. 73.

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
305-723-8659

DIGITAL EVENTS

APRIL 26/28.	Dayton Hamvention.
MAY 4/5.	Albany GA Hamfest with SAPS packet demo.
JUNE 15/16.	SOUTHNET Packet Conference, University of Florida, Gainesville.
JUNE 22/23	ARRL Field Day. Show off those portable packet stations.

MacPacket / TAPRterm

By Jack Brincke, WA4FIB

Packet radio presents many interesting opportunities to its participants. We now have access to many computer bulletin boards where we can leave messages and share programs. The many computer users on the air have used the medium for exchanging computer files and saving QSOs recorded off the air. Those of us using the TAPR TNC with our computers have had to work through the difficult terminal interface built into the TNC. This interface reduces our computers to simple terminals with the power of the computer lost while the user must perform all station keeping to connect, disconnect, or even set the beacon message. The TNC's command list of over 64 commands and parameters does not help the matter, as each one must be learned, and set to properly use the TNC. Many manuals have become worn and dog-eared in the "commands" section. Surely there has to be a better way.

The introduction of the Apple Macintosh computer with its "new" user interface has brought new understanding to the ways information is presented to computer users. The user is no longer saddled with a "text only" presentation scheme, but now is free to use the computer to do his task the way he wants to do it, with information presented in a way that makes using the computer fun! The Macintosh user interface has eliminated the need to memorize long strings of complex commands in order to perform work. Instead, the user simply selects a function, points at it, and "clicks" the selection button! Additionally the renowned graphics abilities of the "Mac" allow information to be presented in a more natural form making interpretation of the data easier. These features make the Mac a natural for controlling ham devices.

It seemed only natural to "marry" the Macintosh with the TAPR TNC. I was was already using the TNC with my Macintosh, running a terminal emulation package called MacTerminal. This package performed quite well as a terminal, but left a lot to be desired when using the TNC. There were several features I desired, such as split screen text display and others described below, that are not available in MacTerminal. Additionally, I still had to memorize the various TNC commands. The answer to the situation was obvious, I needed a terminal package designed for the TAPR board. The result of my development is called MacPacket/TAPRterm.

The first thing the user sees upon executing MacPacket/TAPRterm is a split-screen display with a row of menus across the top of the screen (see figure 1). The screen is divided into two "windows", for receive and send data. All information typed by the user, when not using a menu command, is displayed in the send box. Received text is, of course, displayed in the larger receive window. The receive window is larger to give the user more opportunity to view the data before it scrolls off the screen. The use of split screen eliminates the need for the upper / lower case scheme used by some to differentiate between the two text streams. Both screens make use of the Macintosh TextEdit facility. This means that text may be cut, copied, and pasted between the two screens and the clipboard. This is very useful for resending text just received, or even sending data cut out of other programs such as MacWrite.

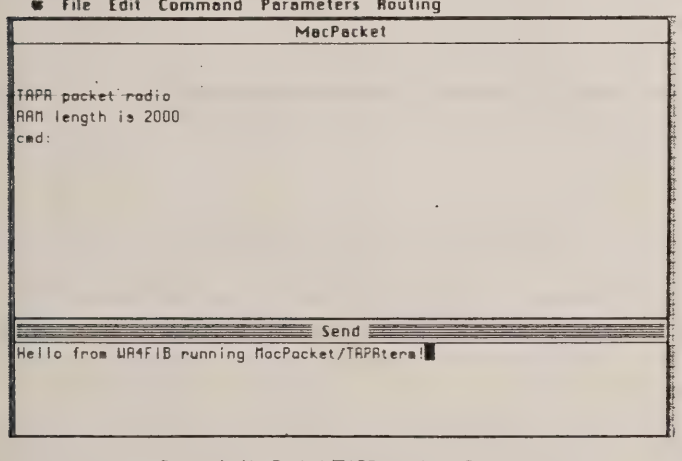


Figure 1: MacPacket/TAPRterm Main Screen

The menu bar contains six menu categories containing commands to control TNC, Macintosh, or TAPRterm functions. The "apple" menu, at the left of the menu bar, contains "desk accessories" for the convenience of the user. Desk accessories consist of small programs to help the user, such as a clock, notepad, and calculator. They may be called up and used at the user's convenience. The next menu contains selections for printing, file send (upload), receive (download), and quitting the program. The print selection simply sends the received data to the printer in addition to the screen. File send and receive allow the user to transfer files to another station. Two modes of transfer are allowed, depending on the destination station. The first is normal text transfer. This would be used in exchanging files with a non-Macintosh station or where normal text is being received or sent. The second format is used to transfer Macintosh binary files. These may consist of MacPaint type drawings, MacWrite formatted files, other Macintosh binary format files, or even Macintosh application programs! This format appends file information to the packets along with a format identifier so that a receiving Macintosh will reconstruct the data in the same form as it exists in the sending station. It should be noted that these files may be stored in any bulletin board that allows binary files. Of course the files would be useless to non-Macintosh computers.

The third column, Edit, contains the familiar editing functions of Cut, Copy, Paste and Clear. These functions are used in transferring text to and from the Macintosh "clipboard" temporary storage area.

The fourth menu category contains the various TNC commands. These commands cause the TNC to perform some task, such as sending the cw id. The commands include: Calibrate (enter TNC calibrate mode), Connect (described below), Converse (enter TNC converse mode), Disconnect, ID (send cw id), Reset (the TNC), and Transparent (enter TNC transparent mode). Calibrate places the TNC in calibrate mode, as described in the TNC manual's hardware section, where the TNC "walks" the user through modem calibration. The Connect selection provides a dialog box (see figure 2) that allows the user to select a station to connect with, set the connection mode (converse or transparent), and select the routing to be used to connect with the desired station. The operator can chose to enter the route calls into the dialog box, or to use pre-stored information in the connect request. The routing information may be used as is, or edited to change, add or eliminate any of the routing calls, in case a station is down or some other path is desired. The dialog box even allows the user to search through the stored routing tables to find a station and route to connect with.

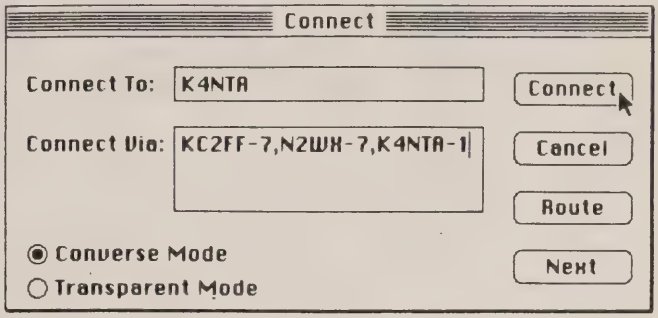


Figure 2 Connect Dialog Box

Routing tables are stored in memory and on disk for up to 100 calls with up to eight relay nodes per call. The information in the tables is edited and modified using the Routing menu. Selecting the edit function under this menu allow the operator to view each entry in the routing table and edit, delete, or add entries in the table. The dialog box uses the same layout as the Connect dialog box, with the addition of file manipulation selections (see figure 3).

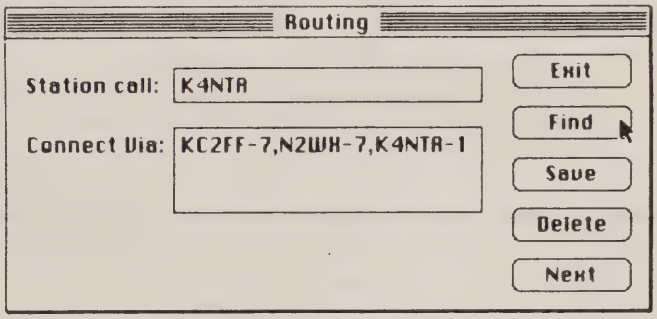


Figure 3. Routing Table Edit Dialog Box

TNC parameters can be viewed and modified using one of the Parameter menu selections. The parameters are divided into seven groups, as defined by the TAPR Display command. The groups are: Character, Id, Link, Monitor, Terminal, Timing, and Trace parameters. Selecting one of the group functions causes the Macintosh to poll the TNC for the parameter information, then display a dialog box showing the data. A typical dialog box, for link parameters, is shown in figure 4.

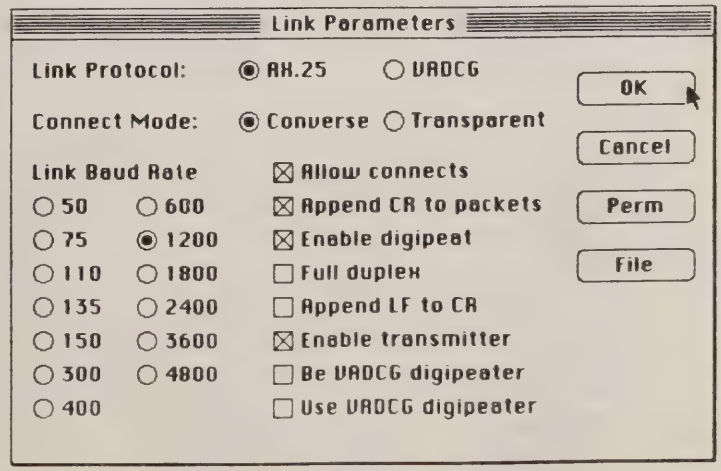


Figure 4 Link Parameters Dialog Box

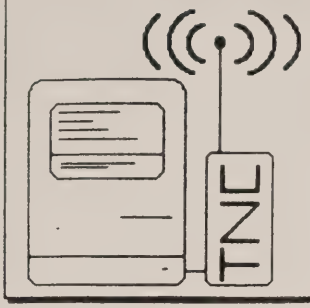
File Edit Command Parameters Routing

MacPacket

MacPacket/TAPRterm is a "front-end processor" for the Apple Macintosh™ when used with the TAPR Terminal Node Controller.

Features:
- split screen display.
- file upload, download and printing.
- menu selection of tnc. commands and parameters.
- Compatible with AEA, Heath & TAPR tncs.

MACPACKET/TAPRterm



Version 1.0

By Jack Brindle, WA4FIB

Copyright 1985, Brincomm Technology

Send

- routing tables to aid in selection of route to destination station.
- list price of $39.95 includes all updates for one year.
- Shipping June 1!

For more information, contact:
Jack Brindle, WA4FIB
Brincomm Technology
19451 Gulf Blvd #503
Indian Rocks Beach, Fla 33535

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Continued from previous page.

The parameter data is displayed along with simple explanation labels that try to indicate what the parameter actually controls. This also eases the command memorization requirement, by having the computer to perform translation of TAPR's terse parameter names. Not all parameters are displayed in the dialogs, and some are controlled indirectly. For example, the Terminal function allows the size of displayed text to be changed. When one of these selections is made, the program automatically calculates the number of characters that size will permit on a line, and set the TNC's Screenl parameter. Parameters not displayed in any dialog box may be changed "the old-fashioned way," by entering the parameter name and data on the keyboard while in TNC command mode. In fact, any of the commands and parameters may be entered this way, should the user desire not to use the menu functions.

The philosophy behind the program is that the computer should take care of as many TNC functions as possible to allow the operator to use the system without any distractions. As packet radio moves to networking and beyond, this philosophy will become more important with each added layer requiring additional control information. The goal is to eventually allow the amateur to sit down at the computer, request a QSO with another station, and begin communication, exchanging files, or whatever else he desires, without having to address linking or routing issues. This goal is still in the future when packet networks and upper layer protocols have been established. For now, MacPacket/TAPRterm goes a long way to isolating the user from the TAPR TNC.

MacPacket/TAPRterm was developed in compiled Aztec "C". The program thus runs without many delays. The few delays the operator may experience are due to the TNC interface, or Macintosh disk transfers. The TNC interface causes some interesting problems. There is no reliable connect status available through the serial port, so the computer must assume that the TNC is connected. But, a normal control/c may be interpreted as data in transparent mode, so the computer must assume transparent mode and initiate the command sequence for that mode. This causes delays while the sequence is executed, thus each command and parameter request reflects this delay. It would be nice if the TNC notified the computer of a connection in a non-text format or through the DCD serial line. This notification would have to use some control character that would not be transmitted in normal TNC operation.

Program development has been very interesting and educational. I now understand the formidable task others have gone through in developing applications for the Macintosh. The operating system is very nice to use since it provides almost every function one can imagine. The task in developing becomes one of learning how to use the large number of system calls. This information is contained in a large (1200 page) two volume manual. The best way I have found to develop new program areas is to first read about the necessary functions, then try to use them. This is a trial and error approach in that several attempts will be necessary before success is found, but the results are both satisfying and usually elegant.

MacPacket/TAPRterm is currently in beta test here in Florida. It is expected that it will be shipping sometime in May, assuming no further features are added. My thanks to K4GFG, W1BEL, and KA4NOF for their help in pushing me in this project. For more information, contact me over the air (packet) through KC4FF-7, or through the mail at:

Jack Brindle, WA4FIB
Brincomm Technology
11941 Gulf Blvd #503
Indian Rocks Beach, Fla. 33535

THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The SCCs are now in stock for shipment.

W9DVM has a pair of Cushcraft 32-19 boomers that he will donate to any FADCA digipeater committee that wants to have a highly directional coverage. Otherwise the antennas are for sale for $100. Phil LaMarche, (800) 282-8944 weekdays.

FADCA has several surplus PAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

The FADCA modem kit as described in the March BEACON is $8.95 which include shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

CONNECT - The Beginners' Column

Don Deem, KB4LLO

I suppose one of the biggest hurdles to overcome when starting a new hobby, or a new area of a hobby, is the specialized language used. I remember when the transistor invaded the electronics industry in the fifties, I raced out and bought a book on transistor theory and operation and was totally lost, it was written in a foreign language I thought! Then the computer boom, another language. Packet Radio is no exception to this rule. Since Packet Radio is a combination of the amateur's computer and radio hobbies, depending on your previous interest, some of the language may be somewhat familiar to you. Our endeavor here will be to fill in the blanks and answer any questions that you may have.

My intention is to begin with the most common words and abbreviations that are used on the nets and at the hamfests. If you have a word or phrase that you want defined, or that you think would be helpful to us beginners, drop me a line. At some time in the future, when we have what we think is a fairly complete and correct list of words, a dictionary will be prepared. You old-timers will assist by commenting on the definitions I hope.

TNC - (Terminal Node Controller) - A microprocessor based device that handles all the chores involved in sending and receiving data, including breaking the data up into packets, keying and modulating the transmitter, and receiving and demodulating signals from other stations.

PACKET - In the simplest terms, a packet is a chunk of data, broken up by the TNC from the data typed in by the operator. A packet is usually 128 characters in length. The packet of data is transmitted in a frame which made up as follows:

FLAG - A unique bit sequence used to detect frame boundaries. Usually made up of eight bits.

ADDRESS - A field normally specifying the destination address, the source address, and up to eight digipeaters. Usually uses 14 to 21 eight bit words or bytes.

CONTROL - A byte which identifies the frame type. The control field describes the purpose of the packet to the recipient. It identifies packets with functions such as initialization, termination, acknowledgement, or request for retransmission. It may also contain a sequence number, indicating a multi-packet message that must be received in proper order.

DATA - This field contains the actual data typed into the TNC by the operator, to be transmitted. The data packet portion of a frame is optional and need not be present in every frame. Most frames used for link control only do not have a data field. This field is variable from 0 to 255 bytes.

FCS - (Frame Check Sequence) This field is an error detection field and is two bytes in length. The two bytes contain the remainder from a division of the bit pattern of the frame by a known value. The receiving device performs the same division and compares the remainder obtained to the one contained in the FCS. If they are the same, the frame is considered uncorrupted.

FLAG - Same as above.

BIT - A binary digit, the smallest unit of data that is handled in a digital computer.

BYTE - A binary word, usually made up of eight bits. Each alphabetic or numeric character using the ASCII code requires one byte of storage.

NIBBLE - Any number less than eight bits, although in an eight-bit system, a nibble is generally four bits.

TAPR - Tucson Amateur Packet Radio Corporation. The TAPR Board is the Terminal Node Controller (TNC) designed and distributed by TAPR.

FADCA - Florida Amateur Digital Communications Association. If you are reading this Beacon, and are not a member of FADCA, take just a moment of your time right now and fill out an application and a check, send it to Gwyn. You will have done yourself a real favor!

BAUD - A communications measure of serial data transmission rate. Loosely, bits per second if no complex data encoding scheme is used. If a biphase encoding scheme is used for example, the baud rate will be twice the bits per second rate because each bit transmitted contains two data values.

FIELD - An area of a larger record, instruction, or other storage location assigned to a particular class of data (such as the address portion of a packet).

ROM - (Read Only Memory) A fixed memory that cannot be readily rewritten.

RAM - (Random Access Memory) Any type of memory that has both read and write capability.

DIGIPEATER - Generally a dedicated transceiver, TNC, and antenna system, the purpose of which is to help weaker stations to cover greater distances. A digipeater usually has some advantage such as antenna height, or high output power, although any station can be used as a digipeater if the operator so desires.

PROTOCOL - The rules by which the software determines responses to received data, as well as to the user's commands and data.

GRAPES - Georgia Radio Amateur Packet Enthusiasts Society. The Atlanta based Georgia packet group.

SAPS - Southern Amateur Packet Society. South Georgia.

PACKET STATUS REGISTER - (PSR) The official Bi-monthly publication of TAPR.

FADCA BEACON - The official monthly publication of FADCA.

LAN - Local Area Network.

AMICON - AmSat International Computer Network - Packet Radio operation on SSC L1 of AmSat-Oscar 10 to provide networking of ground stations acting as gateways to terrestrial packet-radio networks.

AMRAD - Amateur Radio Research and Development Corporation. A nonprofit organization involved in packet radio development. Washington, DC area.

VADCG - Vancouver Amateur Digital Communications Group. The Canadian packet radio development group.

ARQ - Automatic Repeat Request. An error-control technique in which a sending station, after transmitting a data block, awaits a reply (ACK or NAK) to determine whether to repeat the last block or send the next one.

ACK - The control signal sent to indicate the correct receipt of a transmission block.

NAK - A negative acknowledgment. The opposite of ACK.

ASCII - American National Standard Code for Information Interchange. A code consisting of seven information bits. The ASCII code is used for communication of text between the TNC and the user's terminal. Packet transmissions are considered by the FCC to be ASCII.

That makes 30 definitions for this effort. If you have any additions, questions, or definitions that you would like to have included in a future article, just drop me a line.

Those of you who are constructing your boards, here are a few tips to help you to keep your board error-free:

1. Use an iron of small size with a tip temperature not to exceed 700 degrees.
2. Check each joint carefully to insure that no bridges are formed and that the component is well soldered.
3. Don't overheat the components, remove the heat as soon as you see the solder start to flow into the holes (the solder appears to shrink).
4. Keep the solder joints shiny.
5. Double-check each component prior to mounting it on the board.

Board failures are few and far between, but if your board fails, don't get upset. Most failures are caused by failure to follow the instructions (wrong parts placement) or faulty IC's. Good construction techniques make troubleshooting a great deal easier. The easiest way to find a faulty chip is by replacement. Have one of your packet friends bring his board over and simply change chips one at a time until the failure is resolved. Otherwise, let FADCA know about your problem and we will direct you to someone who can assist you.

Those of you who want to increase your knowledge of Packet Radio, theory and practice, don't forget THE PACKETFEST, June '85. Two whole days of informal discussions, seminars, etc. Look elsewhere in this beacon for more information -- DON'T MISS IT!!

FADCA SQUELCH TALES

BY KEITH O'BRIEN N42Q

SECOND THOUGHTS OVER A CUP OF COFFEE... THE GROWING USE OF PERSONAL COMPUTERS IN HOMES, OFFICES, AND EVEN AMATEUR RADIO HAS MADE THE TERM "FLOOPY DISK" A PART OF THE LANGUAGE FOR MANY PEOPLE. PEOPLE WHO WOULDN'T HAVE DREAMED THEY'D BE SPEAKING COMPUTERESE A SHORT TIME AGO.

I FOR ONE WHO FREQUENTLY DOES SPEAK IT, HOWEVER, WONDER WHY FLOPPY DISKS AREN'T VERY FLOPPY, AND WHY THEY'RE CALLED "DISKS" WHEN THEIR SHAPE IS DECIDEDLY SQUARE. HIDDEN JUST BENEATH THE SQUARE PROTECTIVE JACKETS OF THE DISKS - MORE PROPERLY CALLED FLEXIBLE DISKS - IS A "RECORD" FOR STORING COMPUTER INFORMATION IN A CODE OF ONES AND ZEROS. WHY AREN'T THEY CALLED "FLEXIBLE SQUARE RECORDS"?

I ALSO WONDER WHY THE TAPR TNC LEAVES ONE HANGING IN THE CONVERS MODE AFTER A DISCONNECT BY ANOTHER TNC? JUST WHAT CAN YOU DO FROM THERE, EXCEPT SEND UNCONNECTED FRAMES. AND WHILE ON THE SUBJECT OF TNCS, WHY ARE MY TERMINAL PROGRAMS OVER LOADING THE TNC BUFFER. IT APPEARS THAT THE PROGRAM IS NOT SEEING AN X-OFF CHARACTER FROM THE TNC. AND IF IT DOES NOT SEE THE FIRST X-OFF, IT NEVER GETS THE CHANCE TO SEE ANOTHER. BECAUSE IT'S THE ONLY ONE SENT. WHY AREN'T THERE MORE X-OFF SENT?

ENOUGHT OF THE WHYS, BUT CAN'T HELP BUT PONDER IF I'M THE ONLY WHO HAS THE PROBLEM OF WONDERING THESE THINGS. MAYBE I SHOULD STOP DRINKING SO MUCH COFFEE.

DIGIPEATERS SEEM TO BE THE BIG THING IN THE NEWS THIS MONTH. WE'LL START WITH AN UPDATE REPORT ON THE KEY CENTRAL FLORIDA LAKE WALES (KE4PM-1) MACHINE. PLANS ARE IN THE WORKS FOR A RETURN TRIP TO THE SITE AGAIN APRIL 21. ON THE TOWER ARE TWO OTHER 2 METER OPERATIONS, THE LAKE WALES 147.33 VOICE REPEATER AND W4KUM'S RTTY/ASCII MSO ON 145.66. I GUESS CROWDING A THIRD OPERATION ON THE TOP HALF OF THE TOWER IS ASKING A LITTLE TOO MUCH. TO SUM IT UP IN ONE WORD "DESENSE" WOULD DO IT. OF COURSE PLACING THE DIGI ANTENNA ON THE SAME LEVEL OF THE RTTY MSO WASN'T THE BEST OF PLANS. IT WASN'T TO BE THAT WAY, BUT WITH HOIST PROBLEMS MIDWAY THROUGHT THE PROJECT, THAT'S WHERE IT CAME TO REST. THE BOTTOM LINE IS THAT WHEN THE MSO IS UP, THE DIGI IS STONE DEAF! ALSO WE HAVE BEEN GETTING REPORTS THAT WHEN THE MSO IS DOWN, THE DIGI HAS A HEARING PROBLEM FROM ORLANDO. SO WE GOING TO TACKLE THE PROJECT ONCE AGAIN. PLANS ARE TO MOVE THE DIGI ANTENNA UP ANOTHER 60 TO 70 FEET HIGHER, IN HOPES THAT SOME VERTICAL SEPERATION WILL CURE THE DESENSE TROUBLE. THAT WILL LOCATE THE DIGI ANTENNA AT AROUND THE 360 FOOT LEVEL, AND A REORIENTION TO HELP ORLANDO OUT. JIM (K4AHO) HAS BEEN BUSY WORKING ON THE PERMANENT GLB BOARD THE PAST WEEKS, AND HOPES TO HAVE IT INTERFACED WITH A SOLID STATE RIG PROVIDED BY KB4ZS WHEN THE RETURN TRIP IS MADE. THE PENINSULA OF FLORIDA IS NOT BLESSED WITH TOO MANY HIGH SITES, AND THE LAKE WALES TOWER LOCATION IS ON SOME OF THE TALLEST AROUND. IT'S A SUPER LOCATION FOR A DIGI, AND AN ALL OUT EFFORT WILL BE MADE TO GET IT WORKING.

CLEARWATER'S KC2FF-7 HAS RETURNED TO THE AIR THIS WEEK, BIGGER AND BETTER THAN EVER. IT TOO WAS HAVING A HEARING PROBLEM, BUT WAS TRACKED DOWN TO A BAD SOCKET IN THE MODEM CHIP ON THE TAPR TNC. FF-7 ALWAYS DID PUT OUT A FINE SIGNAL, BUT ONLY A FEW WERE ABLE TO GET BACK INTO IT. IT'S BACK IN OPERATION WITH A GLB TNC, A ICOM 27H AND A 160 WATT KICKER.

SORRY TO HEAR THAT FT. LAUDERDALE'S DIGI W4LDP-1 WILL NOT BE RETURNING TO THE AIR. NOT SURE WHAT WILL BE THE REPLACEMENT, BUT CONTINUE TO USE WA1JOU IN IT'S PLACE.

WB4RCY-1 IN JACKSONVILLE, IS ON THE MOVE AGAIN. UNDERSATAND ANOTHER SITE IS TO BE TRIED AND MAYBE WITH MORE POWER. THAT WOULD BE A BIG HELP IN SECURING A MORE RELIABLE CONNECTION TO SOUTH GEORGIA KF4JF. RCY-1 HAS BEEN MOVED SO MUCH, IT MUST HAVE WHEELS ON IT.

GAINESVILLE'S DIGI KF4TT-1 USUALLY HAS A PATH TO KF4JF IN GEORGIA EVERY NIGHT. ONE EVENING WE HAD A ONE HOP SHOT INTO KF4JF'S BBS. ENJOYED THE USE OF THE SYSTEM, LARRY, AND REALLY LIKE THE EASE OF PUTTING MESSAGES IN. NOT A WHOLE LOT OF TIME SPENT ASKING QUESTIONS AND GIVING PROMPTS TO DO IT. LARRY IS RUNNING W0RLI BBS SOFTWARE VERSION 8.8, ON A XEROX 820 SYSTEM.

THAT'S ALL THE TIME AND SPACE FOR THIS MONTH. PLUS IT'S TIME FOR ANOTHER CUP. I WONDER WHY THE DIGI ARE HAVING SO MUCH TROUBLE LATELY....

$49...KEITH

Subj : Ocala Digipeater

K4OZS/R at new temporary location - 130ft, 150W, 2-14 element, pointed to Orlando/Melbourne with good signal to KF4TT-1 in Gainesville. Please give it a try and tell WD4PQN or WB4EXN your comments. TNX es 73, Larry

BYTES FROM THE WRITE ONLY MEMORY

[illegible] F4NTA

Much has been said about FADCA's GATOR Link Network. In case some readers have not heard, GATOR 1 will link the two meter digipeaters on 220 mHz at 9600 baud.

Here is an update of where we stand now. Larry, K4OZS, has wire wrapped two of the 9600 modems designed by Steve Goode. Tom K4GFG and Ron WA1JOU will conduct on the air tests with them on 220. If all goes well, the tests will be completed during May. TAPR says that they are committed to produce these modems boards so it should not be long until there are ample quanities of modems for our GATOR 1 Network. If TAPR is delayed in production of the boards, FADCA stands ready to make a limited quanity run of them.

Howie, N2WX is well on the way to having the GATOR 1 software ready. While this system will not be ISO Level 3, it will do what we need GATOR 1 to do, namely link the digipeaters at high speed to reduce QRM on 145.01. Howie will no doubt have the software completed about the time the modems are ready.

The 1200 baud modem board for the two meter side of the network has been designed by Jerry, N4AJH, for FADCA. This modem board can also be used for HF packet with a TAPR board and is available direct from Jerry (See notice elsewhere in this issue).

The Xerox 820 single board computer and the FAD board rounds out the GATOR 1 node equipment. Howie designed the FAD board last summer to interface with the 820. It contains a Z-8530A SCC chip to make the packets. The bare FAD Board if available from TAPR and FADCA has the Z-8520A chips for $20. Using the FAD board with the 820 is old hat. I have been using the 820, FAD board and one of Jerry's modems for months here as K4NTA-2. The TNC software used for K4NTA-2, called FADpad, is now avaiable. Look for news about it in Howie's column in this issue.

The FADCA Chapters in Broward and Palm Beach counties are well on their way to having the equipment rounded up to put GATOR 1 Network stations on the air. Here in Stuart, I have the some of the equipment but the main part missing is the 220 radio. I am building up the computer part of the station for Jacksonville. Howie's Melbourne digipeater will be converted in short order. As soon as the first link is put in, I am sure that the other LAN's will rush to get GATOR 1 Network stations on the air to link their digipeaters into GATOR 1.

A proposed frequency plan is elsewhere in this issue of the BEACON. Please comment as soon as possible if you see any problems with it. I already know of one problem in Orlando.

We should be able to show a working lashup of two GATOR 1 nodes at the Southnet Packet Radio Conference (Packetfest) in Gainesville, June 15-16. See you there.

PROPOSED GATOR-1 FREQUENCY PLAN

Ted Huf, K4NTA

With our present system of digipeaters all operating on the same frequency, 145.010, we have what I will call self interference. This happens when two or more digipeaters hear one another and either QRM each other or cause one to hold off from transmitting because it hears the carrier of the other. As you know, because we have no way of linking the digipeaters together on another frequency, this is the only way we can communicate past our local digipeaters. This self interference causes retries, which cause more retries until only the stations very close to each other can communicate or until some of the TNC's retry out. This problem is especially bad if there is a BBS in use.

The idea for GATOR 1 is to link the digipeaters on 220 mHz at 9600 baud. The 220 linking frequency will be reserved for linking stations and use a protocol that will provide for acknowledgements between link stations.

Each GATOR 1 link station will be assigned a two meter frequency based on a proposed frequency coordination plan that this article will discuss. For example,

Continued on next page.

lets assign two meter frequency A to Miami, B to Ft. Lauderdale, C to West Palm Beach and D to Stuart. If a Miami station was downloading a file from a BBS in Stuart, frequency A and D would be busy, but frequency B and C would be QRM free. Also the digipeaters in Stuart and Miami would not hear each other as they do now. The relay between Stuart and Miami would be on 220 at 9600 baud. The results would be much faster throughput with no interference to the areas between Stuart and Miami.

This proposed plan uses four frequencies and provides 100 miles separation between GATOR 1 digipeaters operating on the same frequency. In some cases 100 miles may not be enough to prevent self interference. For these cases, if it becomes a problem, perhaps something like an anti-subaudible tone decoder gated to the carrier detect line would prevent the hold off problem.

I have not used 145.010 in this frequency plan and propose that it continue to be used for simplex and digipeaters not tied into the GATOR 1 network.

Greater separation could be obtained with another two meter frequency but in order to stay between 145.000 and 145.100, we would have to use 15 kHz spacing. Comments and suggestions are requested on this plan and the use of five 15 kHz channels.

Keywest	145.050	Orlando	145.090
Homestead	145.030	Ocala	145.070
Miami	145.090	Daytona	145.050
Fl. Lauderdale	145.070	Gainesville	145.090
West Palm Bch	145.050	Jacksonville	145.030
Stuart	145.090	Waycross Ga	145.070
Okeechobee	145.030	Valdosta Ga	145.090
Naples	145.090	Tallahassee	145.050
Ft. Myers	145.070	Albany GA	145.070
Tampa/St Pete	145.030	Panama City	145.090
Lake Wales	145.050	Ft Walton Bch	145.030
Melbourne	145.070	Pensacola	145.050

Msg : 3643 Sec. 0 - ROUTINE
Date : 04/17/85 06:20:15
To : K4NTA (X) (R)
From : K4GFG
Subj : 144 MHZ BANDPLAN

Ted, have you have noticed in the Westnet file that they have chosen redundancy over efficiency and elected to keep all digis on 145.010, even when their backbone on 220 is in place? This may have some merit for FADCA as well. The redundancy theme was also suggested by one of the fellows down this way.
Here's a thought...we might delay moving a digi off 145.010 until a second digi which can span the same 220 links in the area joins the backbone. It would then be assigned a different 145 frequency, per your bandplan. Taking this a step further, we could simply say that the first digi in each community gets 145.010, the second to sign on gets 145.030, the third gets 145.050...etc. Any digis not on the 220 backbone will be assigned 145.010. This might make for a very orderly assignment method for expansion. When loading gets heavy in a region, they can set up a second digi on 145.030 on the backbone. I think we overestimate the need for frequency re-use.

Msg : 3659 Sec. 0 - ROUTINE
Date : 04/17/85 19:38:28
To : K4GFG (X)
From : K4NTA
Subj : 144 MHZ BANDPLAN (Ref: # 3643)

Your idea has merit and will require more thought. I sort of figured that just because two town were able to link up on 220 would not mean that they would QSY. For example if WPB and FtL were the first two to link, and if say WPBmoved to 03 and FtL to 05, what would Stuart and Miami do? It would seem that the linking would have to be pretty much complete before and QSYing was done.

To: All
From: Pete WB9FLW
Subject: Packet Radio Applications

TAPR & the ARRL are joining together to produce a new PACKET RADIO PRIMER videotape. The production will be done in the studios of KSD-TV the NBC affiliate in St. Louis. The new production will lead the newcomer through the basics ofcourse, but it was felt that examples of practical Amateur & non amateurapplications would help make the tape more entertaining and imformative. Sowhat ya say gang, lets hear about your favorite Packet Radio Applications, itmight help to convince someone to join the fun!

EXCERPTS FROM OTHER PUBLICATIONS

THE FOLLOWING COMES FROM DRNET
M 23275 Steve Goode (K9NG,2981) 3/18/85 7:22 PM L:16
KEYS:/CAPRA LEVEL 3 LINKING/
TO: (Group 95)

The second meeting of the CAPRA Level 3 networking committee took place on Wednesday evening, March 13th, at the home of WD9DBJ. By the end of a rather animated 2 1/2 hour meeting, it had been agreed to set a target date of May 1st for installation of the 220 Mhz 9600 Baud link between Chicago and a tower located near the intersection of Indiana State Route 421 and I80 in Otis,Indiana. Two Xerox 820 Micro-computers, one at each end of the link, would be used to test out the link while development of the network software continues.

Also, the group generally agreed to use a slightly modified TCP/IP as a networking protocol. W9TD requested that committee members volunteer to do intensive research on areas of special interest prior to the next meeting,which has been scheduled for April 18th. Those areas of interest include the problems associated with development of a user interface to the network and determination of what modifications of TCP/IP might be necessary to make it suitable for packet radio networking.

The second WESTNET meeting was held as the last Saturday night session of the packet radio meeting in San Francisco. The following groups were represented: Los Angeles Area Packet Radio Group (LAPG), Oregon Packet Radio Association (OPRA), Pacific Packet Radio Society (PPRS), Rocky Mountain Packet Radio Association (RMPRA), Southern California Digital Communications Council (SCDCC), San Diego Packet Group (SDPG), Tucson Amateur Packet Radio (TAPR).

The purpose of the meeting was to gather those amateurs with software, digital hardware, RF hardware, and mountain-top expertise and who share the common goal of improving and extending the west coast packet radio network to determine the next steps toward reaching that goal.

Packet has experienced a 660% increase in California since the first WESTNET meeting. We are now ready to proceed with the first in a series of improvements, the installation of a 9600 baud backbone.

The same WESTNET philosophy holds for this round of updates, i.e., don't wait on the next innovation which is coming "real soon now", make due with what we have and get something running before the snow falls above 5000 feet. At the same time, don't build anything that will make transfer to the next level of technology difficult.

In the spring of 1985, the amateur community still hasn't defined a networking layer protocol. This should be no great surprise, since the commercial world has been arguing about it far longer than we have. We don't have any running prototypes, either. What we do have is a 9600 baud modem design, the ARRL Lab's n-port digipeater software, nearly 350 users in the current WESTNET area running 1200 baud on two meters, and a chain of 7 digipeaters with frequency translation between southern California on 145.36 and northern California at 145.01.

The first step toward improving this situation was to change the southern California bandplan to add the national packet radio frequency 145.01 MHz and get it coordinated for packet radio digipeaters. This was done by a vote of the membership of the Two Meter Area Spectrum Management Association of Southern California (TASMA in late March.

Phase I of WESTNET '85, agreed to at this meeting, is to install 145.01 digipeaters in southern California. This will remove the need to perform frequency translation in Santa Barbaraand will reduce the maximum number of hops to five, with only three hops required to link San Francisco to LA. An immediate improvement in network service will result.

Phase II is to install n-port digipeaters, 220 MHz radios, and 9600 baud modems at each of the digipeater sites. Each digipeater will be linked to its neighbors at the higher baud rate and frequency, and will provide user access to that link via 145.01 MHz at 1200 baud.

Continued on next page.

This will avoid collisions between local traffic around each digipeater and the traffic passing through the digipeater on its way to a more distant point. While not as good as a true network protocol, this will provide vastly improved service over that which is currently available. An appendix to this report will describe the benefits in greater detail, as well as describing the n-port digipeater that makes it possible.

Since the n-port digipeater is implemented on surplus Xerox 820 boards, WESTNET can switch to a true layer three network when one becomes available. The Xerox 820 was designated as he target hardware for the first prototype layer three network software at the ARRL Digital Committee meeting in 1984.

Once in place, WESTNET will allow a user to use the network as if it where a simple chain of digipeaters. He will transmit and receive on 145.01 MHz. If he specifies more than one digipeater in the connect path, his packet will be repeated between digipeaters at 9600 baud on 220 MHz. The packet will be transmitted on 145.01 MHz by the last digipeater in the list. Standard digipeaers can be used on 145.01 as far as necessary in the event a user can not directly access an n-port digipeater site.

It is expected that by the WESTNET '86 meeting, and certainly by WESTNET '87, there will be a true network layer protocol in place, a large number of users and most host/mailbox systems will access the network directly at 9600 baud on 220 MHz, and that the backbone network will be on 1.2 GHz at 56K bps. We also suspect that the 145.01 network access and digipeat capability will always be needed; to handle entry level users, as a redundant path for network failure and resiliency in case of emergency, and to handle users in extreme outlying areas where the number of users and traffic loads do not justify high bandwidth equipment.

The following items were specifically agreed to at this meeting:

The primary two meter input to WESTNET will be 145.01 MHz, using the current Bell 202 1200 baud standard. Other two meter operations can also link in on the 220 MHZ requency, e.g. the 146.745/.145 duplex repeater in southern California, so long as only those packets intended for the link are passed to the link.

The 220 MHz link frequency is 220.950 MHz.

The 220 modem standard is the K9NG 9600 baud modem.

The controller to be used is the Xerox 820, running the ARRL Lab's n-port digipeater code.

We will publish details of how this all comes out as soon as we can, including details of 220 rig modification, software mods to the n-port digipeater code, state machine PC boards for the 820, etc. Until then, please go to the original source for details. The n-port code is available from Jon Bloom at ARRL HQ. Details of the K9NG modem are available in the Proceedings of the 4th Annual ARRL Computer Networking Conference, available through the ARRL. TAPR will be distributing PC boards for the modem in the future.

Harold Price, NK6K

To: Paul Rinaldo, W4RI, American Radio Relay League
From: H. S. Magnuski, KA6M
Date: March 30th, 1985

At the meeting of the Board of Directors of the Pacific Packet Radio Society on March 21st, 1985, the following resolution was passed:

Whereas the Pacific Packet Radio Society was one of the first societies formed specifically to encourage the growth of computer networking via radio using all digital concepts and techniques, and whereas the San Francisco area was the site of the nation's first amateur digipeater, and whereas an even greater challenge faces the amateur radio community to establish a transcontinental link, the Pacific Packet Radio Society has decided to establish a unique award to encourage the completion of the first terrestrial transcontinental network link. This one-time award shall be known as the "Golden Packet" award, and the regulations relating to it are listed below:

1. A transcontinental link must be established, with each terminus located within 100 kilometers of either the Atlantic or Pacific Ocean.

2. The system must consist of fixed terrestrial digital store-and-forward radio links using VHF (greater than 144.1 MHz.), UHF or microwave frequencies. Use of HF, satellite, tropo, metscat or moonbounce channels is prohibited.

3. A valid two-way transmission and acknowledgement of previously unknown information (256 characters or more) must occur in real time (less than ten minutes).

4. This competition is open only to validly licensed North American amateurs, and no commercial links or services may be utilized in the path. Club stations are permitted.

5. Proof of the exchange must be adequately documented and submitted to the PPRS. Proof must include a list of the stations in the link, their locations, frequencies used, and a copy of the text exchanged.

6. The reward shall consist of a suitably engraved plaque with the names of all participating stations listed which shall be presented to the ARRL. Each participating station shall receive either a plaque or a certificate.

7. Final decision on the award is subject to review and approval by the Board of Directors of the Pacific Packet Radio Society.

Respectfully submitted,
H. S. Magnuski, KA6M
Pacific Packet Radio Society
P. O. Box 51562
Palo Alto, CA 94303

PERSPECTIVE

By Harold Winard, KB2M
(reprinted from SATELLITE JOURNAL)

In Russian parlance, a troika consists of three horses, usually hitched to a carriage or wagon and all pulling in the same direction. More recently, the word has been used to describe a council of three leaders, all of whom are required to pull the ship of state in the same direction at the same time. The troika, as a form of leadership at the top levels of Soviet government, has not been successful. One person usually emerges from among the three to take hold of the reins of government. However, leadership by council has been somewhat more successful in other parts of the world, where conformity of opinion is not a prerequisite for membership to the governing body. And despite jokes to the contrary, a committee can indeed take a constructive rather than obstructive role in the affairs of state or, for that matter, the affairs of an organization of any size. If all members of a committee needn't be of like mind to be productive, what is the glue that holds the committee together and the catalyst that prompts it towards action? The glue is commitment and the catalyst, a clearly defined goal.

Every few years in amateur radio, a new technology or mode of operation comes along that requires hams to band together into groups to solve mutual problems. The American Relay League was the result of just such a need and repeater councils are a more recent example of the desirability of concerted efforts by individuals within the framework of an organization. A new technology has forced the amateur community to again think about the need for formal organization. Packet radio, once the plaything of self-described "bearded experimenters," is now a thriving branch of our varied avocation and one that promises to bring us many benefits. One of the first will be PACSAT, an orbiting digital mailbox that will store and forward messages to radio amateurs all over the world. Hams in sparsely populated areas will have no difficulty sending a message to the satellite as it makes one of several passes each day. However, hams living in heavily populated areas will have a problem. Everyone will want to send and receive messages during convenient times and many may not have the equipment or know-how to set up a fully automatic station. A practical solution to the problem appears to be the gateway station. A radio amateur would prepare a message for a distant friend and send it to a regional gateway station for storage and subsequent transmittal to PACSAT during one of itrs several daily passes. It will be able to send messages in an orderly, serial fashion, one after the other, allowing everyone's message to be received and stored without interference.

Continued on next page.

The gateway station makes eminent good sense but it does pose some problems. Like all forms of communication, packet radio requires a set of protocols that extend beyond merely the equipment, software, and communication conventions. In order for people to communicate via packet, especially over very long distances, the amateur community must come to grips with not only what networking scheme to use, but also who will pay for it, who will install it, and who will maintain it. Unlike FM Repeaters, which can be installed by an individual or a club for the benefit of many, a packet radio network is beyond the financial capabilities of the lone ham or even a small group. To stretch data from coast to coast, or even several hundreds of miles across barren terrain demands the expertise of the RF expert, the money of a substantial organization, and the unanimity of all concerned. As a link from one point to another, a gateway station or network controller must be reliable and have the sustaining support of a group large enough to ensure continuity.

With the start of PACSAT development near, now may be the best time to start thinking about how packet activity to the satellite will be handled. It's quite obviously a problem beyond the scope of an individual and requires radio amateurs to once again band together to pool financial and technical resources. The committies and councils formed for the purpose should have a clear understanding of the importance of their work, the short time left to accomplish it, and the absolute need for cooperation, both on the local and regional levels, and also on the national scene. To prepare for the arrival of spaceborne communications, perhaps the newly formed packet committees should undertake a study of how terrestrial communications can be improved. How wide an area should each committee encompass? Who should deal with the interconnect needs of packet committees in adjacent geographic areas? What types of networks should be established and who should be required to pay for the equipment? Those are some of the questions that face the new committees but they are certainly not all.

Some of the stickiest problems will be those that others before have had to deal with, albeit in a different context. For example, can an amateur radio group be truly democratic? That is, should the majority rule on questions of standards and protocols or should such matters be totally within the province of the technical and operations leaders? If money is collected, how should it be spent and for whose benefit? If a digipeater is built, should it be on 220 MHz where it would help populate an as-yet underused band, or should it be available to the larger group of users on the 2-meter band? As you can see, there are many problems to think about and many solutions to be found. Before amateur radio embarks on this grand project to connect the world with digital communications, shouldn't we all think a bit about what directions we should take here on the ground? Like the troika, packet committees will have to pull together in one direction to accomplish their goals.

NON - ELECTRONIC MAIL

Hello Gwyn,

Hope this is in time for the newsletter. Please put an announcement about the Albany, Ga. hamfest on May 4 and 5th. We are planning a packet meeting during the hamfest. Also an update on SAPS "Southern Amateur Packet Society", the hardware is in place for the Adel high site is in place. We are waiting on the fella who is to climb the tower. This site will be approximatly 900 ft. We are still seeking written permission for Waycross and several other possible sites. Due to the intense work going into the Adel site, we have not had the time to get a Xerox board going with N2WX software. We also haven't got the modem built yet. As far as the Macon digipeater, WB4GQX has removed the TNC (WB4GQX-2) from the test site. He is looking for another test site and hopefully we can have something going real soon.

Now for some exciting news. I made history again on March 31, Sunday night, when I connected and talked with a Florence S.C. station. "Direct with Band Cooperation". I connected with WD4KFD, Charlie, through W4ULH digipeter. I then connected with WA4SZK, Don, who has an HF to 145.01 Gateway. WD4EDT & K4WMT are also on there. They were not aware of anyone on in Georgia. They are working on link to N.C. which is linked to D.C. area. Charlie said they would be looking south too, since they know N. Georgia is on packet. Who knows, with 3 or 4 key high sites, Southnet Packet Network extension to Eastnet could become a reality!!

Gwyn, I make a suggestion that would allow all packet operators help get more stations on the air and especially in key areas. When on voice repeaters or HF, talk about packet and the network being established. When someone talks computer, bring up packet. Also, think of friends you have met on radio who like computers. Contact them and inform them how packet and computer go hand in hand. I know it will bring people in who have heard, but not pursued this mode. I know of several stations involved and several TNC's ordered because of me telling them about packet. I encourage every packeteer to look at the map and think of hams interested in computers in all areas, but especially areas with no activity or areas where a key digi would be good and then contact that friend.

73 & God Bless, Wayne Harrell

P.S. We will be needing sources for cheap crystal 2-meter gear for other sites when they become available. A Eufaula, Ala. group has contacted us and I sent the introductory video tape. We will do a demo when they are ready. They have an 820 board someone donated for a digipeater, they don't have a TNC there yet.

FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

NAME:_____ CALLSIGN:_____

STREET
ADDRESS:_____

CITY:_____ STATE:_____ ZIP:_____

HOME
TELEPHONE: (_____) _____ - _____

WORK
TELEPHONE: (_____) _____ - _____

ARE YOU NOW OPERATING: PACKET? AMTOR: RTTY: OTHER SPECIALIZED MODES?

WHAT EQUIPMENT ARE YOU USING: _____

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 5 Brandon, Florida May 1985

NEW PRODUCTS

The Kantronics Packet Communicator

Kantronics has created a new packet terminal node controller that makes getting on packet as easy as getting on RTTY. The unit is ready to use, easy to operate, and compatible with existing packet units. The new hardware design also includes features not found on other packet controllers, including a 1200 baud radio modem, transmit/receive control of square-wave test tones, and both Bell 103 and 202 tones. In addition, the unit is truly compact, measuring 1.9 by 5.9 by 8 inches in the "Kantronics" style extruded aluminum case.

A block diagram of the KPC is shown below. The 6803 microcomputer is the heart of the unit. Data from the 7910 World-Chip modem, your computer, and the EPROM, RAM, and NOVRAM memories feed it.

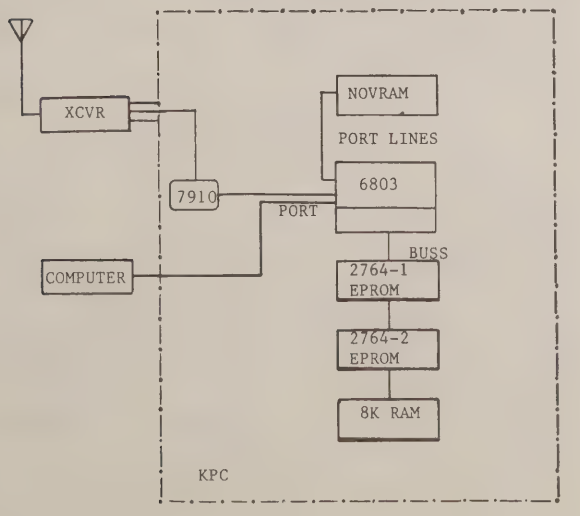
The 7910 modem interfaces with the 6803 via an I/O port. Your computer RS-232 lines and the NOVRAM also connect at the port. The two 2764 erasable programmable read-only memories (EPROMs) and the 8k byte RAM attach via the buss.

All control is under the supervision of the program in the EPROMs. In addition to responding to most of the same commands that other TNCs respond to, such as MYCALL, the KPC has several added commands: BELL, EQU, and CAL. The BELL command is used to configure the modem for Bell 103 or 202 tones. The 103 tones are used at 300 baud. The EQUalize command is used to adjust the modem at two different levels for the incoming AFSK tones. The CALibrate command is new, different from other TNC calibrates. It is used to transmit or receive a square-wave at 1200 baud. This tone transmission is very handy for use by two stations having it to tune to each other or for other tests.

Another plus of the KPC is that it is directly compatible with either RS-232 or TTL levels, thus making it unnecessary for you to get a TTL to RS-232 converter if you are u;sing a Commodore-64! The unit is shipped from the factory with the RS-232/TTL jumper set in the RS-232 position. You can change the jumper if you like; the circuitry is already in the box!

KANTRONICS PACKET COMMUNICATOR

BLOCK DIAGRAM



TAPR Announces TNC 2
or
The Rumors You Heard About Dayton Were True!

Tucson Amateur Packet Radio (TAPR) proudly announces a low-cost, no-compromise Terminal Node Controller (TNC), the TAPR TNC 2.

TNC 2 is a complete packet radio controller, incorporating the experience gained in supplying nearly 2500 TNCs to the world's Radio Amateurs.

TNC 2 utilizes the proven TAPR modem design with a switched capacitor input filter and plug-in headers to configure the on-board modem for various modes of operation, including 1200 baud, 1000 Hz shift and 300 baud, 200 Hz shift.

TNC 2 is based on a CMOS version of the popular Z80 microprocessor, and utilizes the Z80 SIO with a state machine to implement the HDLC NRZI packet format required by the AX.25 Level Two standard. The 8 k bytes of RAM are backed with a Lithium battery to retain all stored commands and operating parameters.

TNC 2 's software provides enhanced monitor mode, full support of the AX.25 Level two protocol, including Version 2.0, and other evolutionary features.

TNC 2 operates from a 12 volt dc (nominal) power source and is significantly smaller than the previous TAPR TNC (now called TNC 1).

TNC 2 is curently in field testing and is expected to be released during the summer. At a price of only $185 for the complete kit, including cabinet, high performance packet radio operation is now affordable by most Amateurs.

PLEASE NOTE: TAPR is not accepting orders for TNC 2 at this time. No waiting list is being maintained.

HF PACKET TUNING INDICATOR
J. W. Gregory, W4QF

The MFJ Model 1221 makes an excellent HF packet tuning indicator. Simply retune to frequencies of choice following the manual instructions. While the integral op-amp filters may not be quite idealized for this use, the unit works just fine.

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THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The SCCs are now in stock for shipment.

FADCA has another shipment of Beehive B-152 terminals. These terminals are guaranteed to work when you get them (but keeping them working is your problem, HI). RS-232 port and auxiliary port, 80 x 24 display, many function keys, etc. Terminals receive upper and lower case, but may only transmit upper case unless modified. Documentation is available. $75.00 delivered to you at the SOUTHNET Packet Conference. P.S. One terminal is available that needs repair. Parts will be provided, but you have to diagnose and repair. Price negotiable. Call or write FADCA at published address.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

FADCA has a modem kit which provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. It was fully described in the March BEACON. The price is $8.95 which include shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

The original run of 100 boards is nearly gone. We will probably make another 100, but there might be a short delay awaiting production.

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 8 AM. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 7:30 PM. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 8 PM NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 8 PM. NCS: K4GFG
CRESTVIEW (Panhandle): 147.360 (+600) Sunday at 8:30 PM (after traffic net). NCS: K3NN
GAINESVILLE: 146.91 (-600) Monday at 8PM.
STUART: 147.060 (-600) Sunday at 8 PM.
WEST PALM BEACH CO: 147.285 (+600) Monday at 8 PM.

SOUTHNET statewide frequencies (Florida)

Primary LAN and calling freq:	145.010
Local QSOs & file xfers:	145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):	221.720, 221.780
Narrow bandwidth linking:	221.400 (20 KHz b/w)
Medium bandwidth linking :	220.570 (100 KHz b/w)

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM[75116,2607], N2WX [75006,702],
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL K4GFG

NEW GLB ADDRESS

GLB Electronics, Inc. is now located at 151 Commerce Parkway, Buffalo, NY 14224. (716) 675-6740.

DIGITAL EVENTS

JUNE 15/16. SOUTHNET Packet Conference, University of Florida, Gainesville.
JUNE 15-0100Z (JUNE 14th local date) North American Teleconference Radio Net, subject satellite communication.
JUNE 22/23. ARRL Field Day. Show off those portable packet stations.
JULY 6/7. Atlanta Hamfestival. Packet forum Saturday at 11 AM. Contact GRAPES.
AUG 3/4. Jacksonville Hamfest. Packet demonstration and FADCA dinner. Contact W4PCM.
OCT 12/13. South Florida ARRL Suncoast Convention (Clearwater Hamfest). Two full days of packet activities. Contact W1BEL.
FEB 8/9, 85. Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park. FADCA will host the 5th ARRL Computer Networking Conference and meeting of the ARRL Digital Committee.

NORTH AMERICAN TELECONFERENCE RADIO NETWORK

FRIDAY - JUNE 14TH, 1985 - 0100 ZULU (15TH)

With the declining sunspot cycle and the worst is yet to come, you will not want to miss the next North American Teleconference Radio Network on June 14th. New and exciting developments in the Amateur Radio space program will be reviewed. Basic information on how you can get started in satellite communications will be provided. Some of the topics to be covered include:

What are satellites?
How can they be used to QSO?
How can you get started?
How do the Amateur Satellites get built and launched?
Where can you go for help in getting started?
What kind of activities are planned for the future?

These, and many otherquestions you may have, will be addressed in teh teleconference. Many opportunites for questions and answers will be provided. No questions will be considered too basic, so if you have been trying to get stated in this area because you're frustrated with the present HF band conditions, now's you chance to get some help. Amsat will have some of its top volunteers available on the teleconference:

John Browning, W6SP
Tom Clark, W3IWI
Bill Tynan, W3XO
Jan King, W3GEY
Vern "Rip" Riportella, WA2LQQ
John Champa, K8OCL
Harold rice, NK6K

Don't miss this opportunity to learn more about the fantastic activities in the works in the Amateur Space Program. Under the direction of net manager WA0IVW - Tim Loewenstein, the net will begin at 9:00 P.M. June 14, 1985 on the following Florida repeaters:

Holly Hill - 147.158	Melbourne - 146.850
Stuart - 147.060	Davie - 146.790
Naples - 146.670	Tarpon Springs - 488.800
Gainesville - 146.820	Orlando - 146.760
West Palm Beach - 146.670	Clearwater - 224.300
Orange Park - 46.670	Panama City - 147.390

Note that persons arriving at the SOUTHNET Packet Conference on Friday will be able to hear the presentation at the informal pizza get together in Gainesville. See you there.

BBS AUTOFORWARDING

Hank Oredson, W0RLI
Reprinted from the NEPRA PacketEar, April 1985.

The following stations run BBSs of one nature or another. All are linked by way of automatic forwarding:

W0RLI	Westford, MA	KA1PN-1	North Canton, OH
K1BC	Lexington, MA	KE1G-1	Goffstown, NH
N1DKF	Cranston, RI	KA1T	Harvard, MA
W1AW-4	Newington, CT	WB1DSW	Manchester, NH
WA2RKN-2	Hyde Park, NY	WB2MNF	Medford, NJ
W3IWI	Clarksville, MD	KS3Q	Baltimore, MD
AK3P	Hummelstown, PA	KF4JF	Hahira, GA
WB4ZNW	Moultrie, GA	KI4XO	Marietta, GA
K7PYK	Scottsdale, AZ	WA4SZK	Florence, SC

XEROX 820 NEWS

EMERALD DOUBLE DENSITY CONVERSION FOR THE 820

Neil Earnhardt, WA3QFN

About a month ago I set out to bring my Xerox 820 big board up as a 64k CP/M computer. First I got the basic 820 working with the on-board monitor ROMS and was able to use it as a packet terminal with a very simple terminal program that called the built in monitor routines. However keying in even the 33 bytes required got to be a bore very quickly, therefore I set out to hook up some disc drives.

The first step was to bring up CP/M with the existing hardware and an eight inch Seimens FDD-1008D disc drive. My first attempt to this was only partly successful. The operating system booted just as the Xerox manual says but I could not do much more than get a directory. The problem is that the Seimens drives required a shorter step time than the Xerox is capable of providing. The software does have a byte that can be changed to modify the track-to-track step time however the Western Digital 1771 controller chip can only be programmed to a minimum of 6 ms which turned out to be not short enough for the Seimens drives. This caused them to jump past the desired track and not able to ever find the track it was looking for.

Previously Gwyn, W1BEL, had made a group purchase of Emerald double density adaptors for the 820. I was able to pick up one of the kits. Once I found the Siemens drives would not work, the Emerald project became top priority as it uses a WD 2793 controller which is capable of 3 mS step time. Also a quick look at the boot track software listing revealed that the user could select drives not only by size but also by speed. More on this later.

The Emerald Microware X120 double density conversion for the 820 consists of a 3.5 by 4.5 inch double sided P.C. board which plugs into the 820 where the 1771 controller and one other TTL gate used to be. The conversion kit also comes with two new monitor/boot roms and a disk with the CBIOS module of CP/M and some other useful utilities.

The Emerald manual is adequate to get the job done but is not a "Heathkit" type manual. I had to reread it a couple of times to fully understand everything that I needed to do. There are four slots available for bypass capacitors that are not mentioned in the assembly instructions. I used 0.1 uF ceramic caps here as is the normal practice on most digital boards. I would also recommend the "hard to find" parts kit also if you just buy the bare board. This includes the pots and caps needed except the bypasses noted above. There is some alignment needed so you will need someone to borrow an oscilloscope from. The alignment is very simple once you have the scope as there is a special test pin that is grounded to do the alignment.

The Emerald board allows simultaneous operation of both 5 and 8 inch disk drives in both single density or double density . The size selection is done with mini-jumpers on the PCB and also in the "boot" sector of the system disk. The "boot" sector is track 0 sector 1. This is called the "boot" sector as most CP/M systems use this track to load a small boot routine to get the system up and running. Emerald had the boot software in ROM so they use this track to hide away your custom hardware configuration. This track and I spent many hours together. As I mentioned earlier the Seimens 8 inch drives are very fussy about step times. I first brought my system up as a 8 inch single density system with 3 mS step times. It booted fine but would take a ridiculous amount of time to do simple things like a directory. I watched with great interest as the controller sent the head right off track 0 into non-formatted no-mans land. I finally decided to use a 6mS step time and discovered that all worked fine. (Why 6ms works here but not with the original controller is a mystery.) At times like this a utility called DUU (disk utility universal) came in real handy as it allows you to patch a sector on a disk one byte at a time. This allowed me to change the byte in the "boot" sector that controlled the step rate.

To create an Emerald system disk is very simple, mostly do to the fact that the software authors have included several "submit" files. To those of you unfamiliar with this a "submit" file is a list of commands in a file that is automatically stepped through by a program specifically intended for this purpose. It works just like you had typed in all the commands yourself. These submit files are set up to automatically bring together all of the necessary files into memory in preparation for system generation. Emerald actually provides a public domain version as some people might not have the Digital Research "submit" program.

It should be stated that it is necessary to have a CP/M system up and running to create your Emerald system disk. Emerald recommends using the 820 to generate a 8 inch system disk before making the modifications to the 820 board. I was unable to do this as I could not make the Siemens work on the 820 as it was. Therefore i had to make my first system disk on my old faithful IMSAI 8080 S-100 system. The instructions tell you to be sure that you have MOVCPM and DDT on your disk as well as the appropriate Emerald files for the type of system you want to create. These files would be a BOOT.HEX and a XBIOS.HEX for the type of system that you would like. The source code is provided for the BOOT and the XBIOS so that u can change them for your particular hardware. Also several versions of SYSGEN are also provided to actually write the system onto the system tracks of the destination disk.

Now that you have your system disks (make several just in case) safely put aside you are ready to make the modifications to the 820 itself. The instructions are specific here and do work if followed carefully. The most difficult part is that it is necessary to remove several chips from the board. This is most easily done with a good vacumm powered solder sucker which I was able to borrow at work. If you don't have one of these available it is best to cut the pins off the ICs and then desolder one leg at a time and remove it. The 1771's socket and three 16 pin chips must be removed. Two data bus buffers are removed and replaced with noninverting type buffers as the 2793 is inverted from what the 1771 was. The 7406 (u117) is removed and its socket is used to provide the Emerald board with additional signals. I used long wirewrap sockets on the Emerald board for J1 and J2 and then used the AP products female headers that Emerald recomends. This allows the Emerald board to just plug in piggyback style. This makes for a very nice installation. There are several other cuts and jumps that also must be made to the 820 board.

About the time I got the eight inchers working good I received some Shugart SA-465 DSQD 80 track drives from Priority One Electronics. They had a sale on them for 99 bucks each. I simply hooked these up with the 5 inch drive cable that I got with the 820 (original Xerox cable) and attempted to use them as drives C and D. However, the Xerox cable is wired through all the interconnects as A and B. Therefore I removed the select minijumps and ran a clip lead over to the drive from the DS3 to the drive select pin on the drive. This made the new 5 incher drive C. This was necessary so that I could make my 8 inch system operate long enough to generate a 5 inch system disk. I first formated a 80 track Kaypro 8 format disk with the Formatx utility. Then I ran the submit file that generates a 5 inch system on A and B and 8 inch on C and D. I patched the submit file so it would tell "sysgen" that the destination drive was drive C: (the 5 incher). Then all I had to do was remove the clip lead and place all my select minijumps to make the 5 inchers A and B, and the 8 inchers C and D. Then I hit the reset and up it came. My system is currently running as DSQD 5 inch with 784k storage on each 5 incher. I have not run double density on the eight inch disks yet as this requires modifing the Xerox board to 4 or 5 mhz due to the higher data rate that 8 inch DD requires. However Ray, KK4S, tells me that he has sucessfully changed his 820 to 5 mhz without any problems. It is necessary to replace the Z-80 family of chips with the faster A versions and the processor itself with the B version. This of course will mean more unsoldering of chips if you choose to do this. It is only necessary if you want 8 inch double density or just want the computer to run programs faster. With the two 5 inch at 784k that's 1.5 megabytes on line and I think that will do me for a while.

One other thing that the Emerald allows you the option on 5 inch drives is the motor on line. I hooked up an additional wire on my drives as the original cable did not have the "motor on" signal. I did not like the effect. The motor on line is not selective in its action. In other words, if it is active both 5 inch drive motors kick on. The way I have mine set now is that the Shugart drives as well as many others have optional "motor on when selected" jumpers. I placed that jumper in the drives and then only one drive motor was on at a time. However the thing never shut off as

Continued >>>

FADCA SQUELCH TALES

By Keith O'Brien, N4ZQ

Where to start? The past few weeks have seen so much going on in the Packet World, one does not know where to begin. With the HF band at it's lowest level the past month, and the same old voices on your local repeater, you would think that Ham Radio has all but dried up. Not so if you have been tuned in with the digital scene. New products, Dayton, digipeaters, incorporation, to name a few, are all worthy of headlines. What we hope to do this month is just briefly touch upon some of the side notes of the major recent events, and leave the details to the other articles.

With the Dayton hamfest of '85 now history, along came the major announcement from TAPR of a new TNC. Called the TNC-2, it's a Z80 based controller with a price tag reported at $185, including cabinet. But the real news behind all the glamour of the new product, is that FADCA's own Howard Goldstein, N2WX, is the author of TNC-2 software. Many of us who are operators of TNCs don't recognize the fact that someone had to write the operating system for the controller that we all take for granted. We just turn it on and expect it come up, without giving it a second thought. As if it was always there or just grew in the EPROM by itself. I guess we lose sight of the fact that the software was the culmination of ones sweat, tears, and many many hours of hard work. I for one am very proud, as all of FADCA should be, to have an exceptional individual like Howie in our ranks. I tip my hat to you N2WX, and along with that a sincere thanks for an outstanding job, well done! Howie's unselfish accomplishment also puts to final rest the old proverb "computers are dumber than people, but smarter than programmers".

As reported two months ago, Kantronics did reveal their Packet Communicator to the public at Dayton. Understand there are some very innovating design concepts in the Communicator. It's capable of software selecting either Bell 202 or 103 tones for 300 baud operation. This allows operation on a lower tone set for improved HF operation. Having had a 20 meter LSB packet set up, and knowing that signal tuning was very difficult, I was wondering how Kantronics was going to accomplish it. Especially since there are only 3 LEDs on the front panel labeled Power, Rcv, and Xmit. We understand that signal tuning is aided with a built in, software generated, on-screen frequency counter. Anyone who has ever tried to put a Packet signal thru the "Bird" could really appreciate that! Can't wait to see the Kantronics Packet Communicator in operation. That will not be long, because Kantronics is providing a pair of them for demonstration at the SOUTHNET Packet Conference in June. I will give a rundown on their use at that event.

Heathkit sold out of all 60 HD 4040's that they had along with them at Dayton, and that was the last of the initial production run of 500 units. Seems they underestimated the demand for it, and now a back order log jam exists. For those of us that own an original TAPR kit board, TNC-1 as it will now be known, and are running it in the nude, good news comes forth. Late word, just in, is that Heathkit will be putting a cabinet package together to accommodate us. Using the good looking, small profile Heath box, it should be a welcome addition. Not sure of the price yet, but understand it will be considerably less then the TAPR cabinet, which is no longer available. One problem that will have to be worked out is mountings for the TAPR power supply components, but nothing that a little ingenuity cannot take care of. Also hope the kit includes a new set of LEDs, as I flush mounted mine to the TAPR board. Heard that they only planning a run of 100 or so cabinets kits, but believe they could sell that many in Florida alone. Careful Heath, think you might be short again.

STANDARDIZATION! With the release of the new Packet hardware, to bad the amateur digital designers did not standardize the I/O connectors. I'm refering to the radio interface connectors on the TNCs. It's bad enough that we have to contend with different mike connectors on our rigs, but now we see a myriad of different types on the TNC end. Early TAPR Beta boards used a ribbon cable connector for rig interfacing. The orginal TNC-1 Kit used a DA-9 female 9 pin. Kantronics has chosen the 5 pin DIN connector as well as the new TNC-2. Bet you dollars to doughnuts, they are not wired the same. The point is that it would have been nice if anyones TNC could have been put on line with any other. Especially in an emergency situation, where I think the power of Packet lies once networking gets underway. The last thing one needs to worry about during a crisis, is whether their set up will interface with another's if it should fail or be replaced. Thank goodness the early pioneers of digital interfacing sat down and worked up a few standards. Or it be anyone's guess how their RS-232 is connected. Wish the Packet world had the foresight to attempt it.

Unfinished business. Last month we left off with a planned return trip to the Lake Wales, KE4PM-1, Digipeater site. A repeat trip was necessary do to the fact that PM-1 was experiencing a severe desence problem from W4KUM's RTTY MSO. We're happy to report that after an early Sunday morning tower climb by KE4PM and KB4CIA, moving the Digi antenna up another 70 feet cured the problem. The 4 bay array was also relocated to a north tower leg, to see if improved coverage to Orlando could be had. This small miracle was accomplished without adding any additional line loss to the system. Unfortunately moving the antenna caused a signal null to the lower southwest coast of the state without a real improvement toward the north. From my location due west of the site, it did increase the signal by 20 DB though. It looks like it will nicely fill the void from Tampa to the East coast LANs, during the daylight hours when no 120 mile path exists. Running only 20 watts from the old Motorola tube rig, improved performance could be realized if a solid state rig were found for the site.

A major revision to the digipeater path for the lower southeast coast has taken place. Word came just after the April Beacon went to press to make the correction. Last issue mentioned that Ft. Lauderdale's Digi W4LDP-1 would not be returning to the air, and to use WA1JOU in it's place. Well it seems that imformation was not correct either. The final word is that Ft. Lauderdale's LAN is to be replaced by the Hollywood LAN and and the Boca Raton LAN and to use WA4WHD-1 and WB4QNX-1 to bridge the gap. See the updated map included in this issue.

What could be a first for Florida, at least for central Florida took place earlier in the week of May 5th. Don, KB4LLO in Bradenton, established a two way connection with KB4FSK in Opp, Alabama! Using KF4TT-1 in Gainesville as the only digi, it marks the first known contact to our Southnet neighbors by a peninsular station. A planned digi is in the works for the panhandle in Crestview, Florida which will make reaching Alabama a little easier. Nice going guys!

A final word and a thanks to Dick, W4PCM from Jacksonville, for the work put forth in his efforts to get FADCA incorporated as a nonprofit organization. Not really sure of the legal ramification of it, but Webster's defines incorporated as "combined into one body or unit - united". And that we are!

See you in Gainesville, June 15 and 16, at the SOUTHNET PACKET FEST.

$49.... Keith

Continued from previous page.

the select never became inactive. I then discovered that Emerald provided for this with a jumper for "select when motor on". I enabled this feature and this deactivates the select lines whenever the motor on line times out. This also turns off the red LED on the drive.

The Emerald manual appears to have one error that Ray pointed out to me. The manual says that 5 inch drives do not need write precompensation. Ray found out the hard way that his did. He had several discussions with the folks out at Emerald and they agreed that many 5 inch drives do need it. I checked my manual for the Shugart 455/465 and it says to use it. Therefore check your manual for your particular drive.

The Emerald software provided does not include the source code for the two Boot/Monitor ROMS. I talked to Emerald about the availabilty of the source code and they said that it was written by the folks at Micro Cornucopia. They said they were supposed to receive it soon from them and then would make it available for sale. This is important to have in case you need to make any hardware changes or have other reasons to dig deep into the BIOS modules. The CBIOS that is provided makes extensive calls to the ROM module and I found myself several times wishing I new what it was doing in there.

I hope that this article has helped those of you who are about to buy or build an Emerald double density board. Let me know if you have any questions and I'll try to help out. Emerald Microware, P. O. Box 6118, Aloha, OR 97007. (503) 642-1860.

GATOR - 1

9600 BAUD LINKING
Tom Kneisel, K4GFG

Thanks to K4OZS for a job well done in wirewrapping two K9NG modems. He did a very neat job, plus caught a few bugs in the design. I borrowed two TAPR TNC's and hooked in the 9600 baud modems. That was a simple matter of disconnecting the on-board 1200 baud modem by plugging into the disconnect socket J5. To make the TNC's run 9600 baud I connected J7 to the high speed clock side as Lyle Johnson wrote in PSR #12. I hooked the modems back to back (without radios) and presto, I was packeting at 9600 baud from one side of the dining room table to the other. The data waveforms all looked good, and the clock recovery state machine was hummig-along. There is a glitch in the carrier detect circuit however, which keeps the output frozen to a "1". I am investigating a solution.

The next step is to hook the Hamtronics 220 Mhz transceivers into the loop. That is proving more difficult than expected. Their transmitters will not operate at full power without spurious oscillation. Steve Goode had to detune his to a lower power level, and I am finding the same on the two that I have. But take heart, those of you with FM-5's. I own one, and we WILL find a solution to this problem. But until that solution is found, I do not recommend that packet groups run out and purchase the Hamtronics FM-5 for 220 Mhz linking, and I have begun a search for alternative radio gear. I expect to have the TNC's, modems, and radios all talking to each other at Gainesville. Come see just how fast 8 digipeats can be at 9600 baud!

CONNECT - The Beginners' Column

Don Deem, KB4LLO
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This month has seen more and more new calls scrolling across my screen. In an effort to determine where all these new Packeteers were comming from, I attempted many connects. Fortunately I was successful and was able to meet N4APG, Bill in Sarasota, KB4FSK, Gill in Alabama and my old friend KI4FH, Bert in Tampa. I tried several others unsuccessfully and will try again as the opportunity presents itself. Several things became clear to me as a result of these contacts and others I have made in the past; we beginners all have a common problem. We are on the air finally, eager to burn up the airways, but we don't know how! In this column I will attempt to clear up some of the questions I've heard.

I'm sure that most of you have heard the discussions concerning BEACONS and the CWID. In fact these features of the TAPR kit board, the AEA board, and the Heath HD-4040, are user options.I have discussed these items with several packet people, some are against using both of them, others feel strongly that both are necessary. Common sense tells me that the beacon is a very useful tool for the beginner, because it lets him know who is on frequency available for conversation. I think that the repetition rate should be determined by the activity on the particular frequency on which you are operating. If activity is high then reduce your beacon rate. The CWID is no longer an FCC requirement. If you wish to use it, do so with discretion. Let us know your feelings on these two options.

It seems that we have a substantial number of new people who are apartment dwellers, and as you might imagine, have antenna difficulties. KI4FH, Bert, (Tampa) recently moved into an apartment and was having all kinds of signal problems operating with a mobile 5/8s mag mount located in the middle of his water bed. W4APV, Jim suggested he move the antenna to the refrig erator to provide some ground plane. In the process Bert recalled how KF4EF, Pat had solved a similiar situation at a demonstration held at the Tampa Heath-Zenith store when Pat turned the antenna upside down and fastened it to some metal ceiling support. So Burt attached the mag mount to the rain gutter outside his second story window. As a result I was able to copy Bert S-9 forty+ miles away.Now Bert is heard everywhere. The point is that you don't need a huge antenna system to get on packet, just enough to digipeat through a neighbor that does. Remember, all packet stations are potential digipeaters.

The TAPR TNC kit board (now called the TNC-1), includ ing the the Heath and AEA versions, has three operating modes. The COMMAND mode is the mode from which you enter all commands that alter the TNC's operating parameters. This is the mode from which you initiate a CONNECT to some other station. Once you have connected, the TNC automatically goes to the CONVERSE mode (no prompt symbol) and you are ready to communicate. Now in order to return to the COMMAND mode, you must hold the CTRL key and simultaneously press the C key. The CMD prompt on your screen tells you that you are now in the COMMAND mode. Now, assuming that you have made the parameter changes you wanted, and you now wish to continue with your conversation, type CONVERSE (short form CONV) and C/R or ENTER and you will be in the CONVERSE mode. The third mode is the TRANSPARENT mode. This mode is primarily used to transfer large amounts of data between computers and is generally of little interest to beginners. The TRANSPARENT mode and data transfers will be the topic covered in a future CONNECT column.

As far as I know, there are no formalized operating procedures for packet radio operation, but here are a few DO's and DON'Ts that may seem obvious because they reflect good radio operating procedure:

1.You don't have to ask permission to digipeat through someone. You will not interfere with his operation.
2. If you CONNECT to a station 'saving connects', or any other station, be sure to disconnect when you are finished. If you don't you leave his station locked up. NOTE: The 'double disconnect' is a term for giving the DISCONNECT command twice in sequence. That causes your TNC to become disconnected without receiving acknowlegement from the other TNC. Thus the other TNC is left connected until that operator corrects the situation. Only use the 'double disconnect' when the other station has 'retried out' and your TNC cannot get a disconnect acknowlegement.
3. Don't attempt to utilize a BBS during 'prime time' until you have become familiar with its operaton. BBSs really tie up a channel and operators should not have lengthy sessions during busy operating times.
4. If you try a CONNECT and don't make it, try another route or wait for more favorable conditions. Don't set your RETRY to 0 and bang away all evening. In fact, it is a good practice to test for a good path by trying a connect to your own callsign via the route of digipeaters to your intended destination and back. That way you can determine if propagation will support the path you desire. If you just try the connect initially, you may get a connect frame to the other end but never get his connect acknowlegement back. You will think the signal never got to the other end, when, in fact, you have locked up the other TNC in a connected state. (A pending software update will cause the locked TNC to 'time out' of the connected state after 5 minutes.)
5. Limit your use of the CTRL G (Bell), because you 'ding' every terminal in the LAN when you use it.
6. Turn your CWID OFF when you don't intend to use it.
7. When the band is busy, keep your beacon repetition to a minimum.

BROWARD NEWS
Tom Kneisel, K4GFG

Many newcomers are showing up on the Gold Coast, most recently WB4EJE, KA4HLO, KA4RPD, W4QF, N4DEV, and WW4V. WA4WUP has a new Heath TNC on the air and K4OZC is building one. W2IDX has a TAPR TNC on the way.

K4SLF is interested in sending digital video by packet, and says that a 256 X 192 image will take less than one minute at 1200 baud. (I suppose that's if there are no digipeaters in the loop!)

The Hollywood digipeater WA4WHD-1 is now on the air thanks to Ed, W4FQM. Ed operates the local 146.70 RTTY machine, and has taken a liking to packet as well. The link is solid to the W4NVU digipeater in Miami. Many Miami packeteers find they can reach W4WHD-1 directly. To the north coverage is good throughout Broward County and the link to the Boca digipeater is expected to be solid.

That's what everyone is anxiously awaiting.....the Boca digipeater by the IBM ARC. WA2HFA is putting the final touches on the TAPR TNC, and expects to have WB4QNX-1 digi on the air about the time you read this. That should give Southnet a solid, reliable link from West Palm to Miami. Finally we will bring the active Miami group into touch with the rest o the state! Try bouncing a few packets down the WA4ARE-1, WB4QNX-1, WA4WHD-1,W4NVU pipe.

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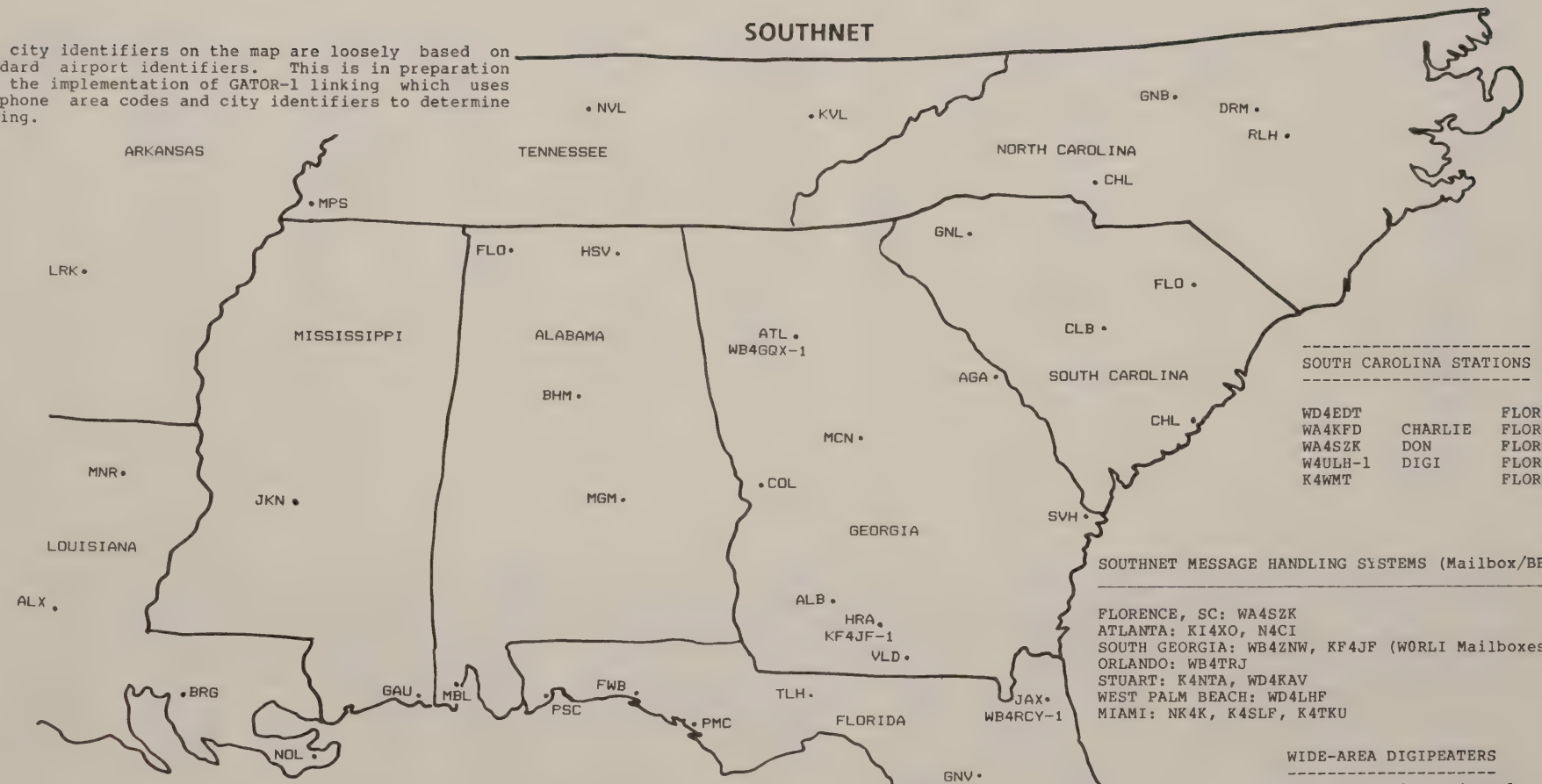
Volume one (1984) back issues of the FADCA>BEACON are available for reproduction and mailing costs of $.75 per issue, or $5.00 for the entire year (11 issues). Send your request to the FADCA address.

SOUTHNET

The city identifiers on the map are loosely based on standard airport identifiers. This is in preparation for the implementation of GATOR-1 linking which uses telephone area codes and city identifiers to determine routing.



SOUTH CAROLINA STATIONS

WD4EDT		FLORENCE
WA4KFD	CHARLIE	FLORENCE
WA4SZK	DON	FLORENCE
W4ULH-1	DIGI	FLORENCE
K4WMT		FLORENCE

SOUTHNET MESSAGE HANDLING SYSTEMS (Mailbox/BBS/MSO)

FLORENCE, SC: WA4SZK
ATLANTA: KI4XO, N4CI
SOUTH GEORGIA: WB4ZNW, KF4JF (W0RLI Mailboxes)
ORLANDO: WB4TRJ
STUART: K4NTA, WD4KAV
WEST PALM BEACH: WD4LHF
MIAMI: NK4K, K4SLF, K4TKU

WIDE-AREA DIGIPEATERS

FLORENCE, SC:	W4ULH-1
NW GEORGIA:	AA4EO-1
ATLANTA:	WB4GQX-1,
(146.13/73)	KD4NC-1
HAMPTON, GA:	WA4TXT-1
FORSYTH, GA:	WB4GQX-2
BUSEE MT, GA:	W4EAW-1
TIFTON, GA:	KF4JF
JACKSONVILLE:	WB4RCY-1
GAINESVILLE:	KF4TT-6
OCALA:	K4OZS
MELBOURNE:	N2WX-7
ORLANDO:	N4JWX
LAKE WALES:	KE4PM-1
TAMPA:	W1BEL
CLEARWATER:	KC2FF-7
STUART:	K4NTA-1
OKEECHOBEE:	WA4IYY-1
PT CHARLOTTE:	KB4CIA
W. PALM BEACH:	WA4ARE-1
BOCA RATON:	WB4QNX-1
HOLLYWOOD:	WA4WHD-1
MIAMI:	W4NVU

NORTHERN GEORGIA STATIONS

WB3ANQ	LARRY	LAWRENCEVILLE
K4APD	GUY	CUMMING
KC4AU	BILL	CONYERS
N4BGL	JOHN	MARIETTA
K4BYK	JOHN	CUMMING
N4CI	ERIC	CONYERS
N4CLI	FRED	ROSWELL
WB2CPV	BILL	NORCROSS
WA4DHD	JIM	GRIFFIN
WB4DSD	KAY	(v WB4GQX)
W4EAW	BOB	CUMMING
AA4ED	DARYL	ROCKYFACE
AA4GA	LEE	CORNELIA
WB4GQX	DENNIS	CUMMING
WB4HYY	JIM	ATLANTA
K4IHP	JOE	SANDY SPRINGS
KF4JJ	JOHN	CONYERS
WD4KDT	HARVEY	STONE MOUNTAIN
N4KHQ	PETE	DAHLONEGA
WA4MEI	RANDY	REX
WA4MIZ	AL	ATLANTA
KD4NC	DOUG	MARIETTA
K4OAH	GAREY	DULUTH
W6OTE	AL	ROSWELL
KA4OVX	CHRIS	(VIA N4CI)
KI4PD	JIM	GAINESVILLE
WB4PTT	BASIL	KENNESAW
WB4PYL	DAN	MARIETTA
WA7RZW	JON	STONE MOUNTAIN
W2WVA	BILL	YONAH MT.
KF4XN	MIZELL	WHITE
KI4XO	JOHN	MARIETTA
KC4ZU	MICKEY	DULUTH

CENTRAL GEORGIA STATIONS

WB4BDP	CLYDE	WARNER ROBINS
KE4EE	JERRY	WARNER ROBINS
W4HON	JIM	WARNER ROBINS
KF4FR	GEORGE	WARNER ROBINS

SOUTHERN GEORGIA STATIONS

KA4DPF	BOBBY	TIFTON
KB4JF	CURTISS	NASHVILLE
KF4JF	LARRY	HAHIRA
WD4LYV	WAYNE	SYCAMORE
WD4MNT	BOB	CORDELLE
K8UTY	CHUCK	ALBANY
K4XA	JOHN	ALBANY
WB4ZNW	GLEN	MOULTRIE

ALABAMA STATIONS

W4ATK	JIM	BIRMINGHAM
KB4FSK	GILL	OPP
K4HAL	HENRY	BIRMINGHAM
W4HFU	FRANK	HUNTSVILLE
KB4JHV	MIKE	MOBILE
WA4YQT	TOM	ENTERPRISE

MISSISSIPPI STATIONS

WA5DVV	PAT	GULFPORT
WA5MPI	WALT	GAUTIER

BOCA RATON LAN
WA4QNX-1 DIGIPEATER

WD0EEL	JIM	BOCA RATON
WB4EJE	BOB	BOCA RATON
WW4V	JERRY	BOCA RATON

DAYTONA LAN

FORT MEYERS AREA LAN

KB4CIA	RICK	PORT CHARLOTTE
KB4CIB	TINKER	PORT CHARLOTTE
WB1CYM	SEL	PORT CHARLOTTE
WD5EBW	ANDY	FT. MEYERS

FORT WALTON BEACH/CRESTVIEW LAN

N4DAS	LYLE	FT WALTON BEACH
N4HMD	WOODY	SHALIMAR
N4IDW	SHEILA	VALPARISO
K4LPT	STAN	CRESTVIEW
K3NN	BILL	VALPARISO

GAINESVILLE AREA LAN
KF4TT-6 DIGIPEATER

W4DFU	G.A.R.C.	GAINESVILLE
WD4EPK	ERNIE	KEYSTONE HGTS
WB4JCM	BOB	GAINESVILLE
WA4NWO	JOE	GAINESVILLE
KF4TT	SCOTT	GAINESVILLE
K3YAN	DUANE	GAINESVILLE

HOLLYWOOD LAN
WA4WHD-1 DIGIPEATER

WD4CWG	JEROME	FT. LAUDERDALE
N4DEV	JOHN	MIRAMAR
WB4EHG	DICK	PEMBROKE PINES
WA2EXQ	LLOYD	FT. LAUDERDALE
K4GFG	TOM	DAVIE
WA1JOU	RON	FT. LAUDERDALE
N4KBA	PHIL	PLANTATION
WB4MMP	BRIAN	PLANTATION
KA4RPD	RON	HOLLYWOOD
WB4TUR	RALPH	DAVIE
WA4WUP	STAN	FT. LAUDERDALE

JACKSONVILLE AREA LAN
WB4RCY-1 DIGIPEATOR

WD4ASW	BARRY	JACKSONVILLE
KB4B	JACK	JACKSONVILLE
WD4BIW	BOB	JACKSONVILLE
W4PCM	DICK	JACKSONVILLE

KEY WEST LAN

N4IMI	BOB	KEY WEST
K4OFG	BERNIE	KEY WEST

MELBOURNE AREA LAN
N2WX-7 DIGIPEATER

K3AAX	DAVE	MELBOURNE
N4AJH	JERRY	MELBORNE
N5AUV	GEORGE	PALM BAY
N4BE	JIM	MELBORNE
W3BH	BOB	TITUSVILLE
N6DLW	RON	PALM BAY
N4DNW	BILL	PALM BAY
N4GEB	BOB	MELBORNE
KI4IB	EL	VERO BCH
KF4IN	DAN	SATELLITE BCH
WA4ITD	FRANK	COCOA
KB4IU	JACK	SATELLITE BCH
KE4IY	GARY	CAPE CANAVERAL
AC7N	PASCAL	MELBORNE
KS4N	BILL	INDIALANTIC
K4TL	CURT	MELBORNE
WA4VME	RAY	PALM BAY
KF4WJ	JIM	MELBOURNE
N2WX	HOWIE	PALM BAY
K4ZS	FRED	TITUSVILLE
WB4ZXS	JOHN	COCOA

MIAMI AREA LAN
W4NVU DIGIPEATER

K4CAG	CARLOS	HOMESTEAD
KC4DE	LEO	MIAMI
KB4ES	PAUL	MIAMI
KA4HLO	CARL	MIAMI
WD4JKM	BILL	MIAMI
NK4K	BILL	MIAMI
K0KBY	NEIL	MIAMI
NX4L	STEVE	MIAMI
WD4MBL	RENE	MIAMI
W4NVU	DADE EOC	MIAMI
W4PJI	GIL	HIALEAH
W4QF	JACK	KENDALL
NJ4S	FRANK	MIAMI
WD4SFG	JOHN	MIAMI
K4SLF	JOHN	S. DADE
KI4T	JOEL	MIAMI
K4TKU	JIM	S. MIAMI

OCALA AREA LAN
K4OZS DIGIPEATER

AA4CG	BERNIE	CRYSTAL RIVER
WB4EXN	TONY	OCALA
K4OZS	LARRY	OCALA
WA4PEQ	CHUCK	CRYSTAL RIVER
WD4PQN	AL	OCALA

ORLANDO AREA LAN
N4JWX DIGIPEATER

K4AHO	JIM	ORLANDO
N4BLD	BOB	ORLANDO
WD4BMN	LARRY	ALTAMONTE SPRGS
K1CYG	STANLEY	ORLANDO
WA4DDX	HARVEY	MAITLAND
WD4GDB	CHET	ORLANDO
WA4GIF	BUTCH	CITRA
WD4HIM	BRUCE	ORLANDO
W5HUG	JOHN	ORANGE PARK
N4IPX	STUART	ORLANDO
N4JWX	DAVE	ORLANDO
K3KKA	BOB	ORLANDO
K8KNI	FRED	ORLANDO
N4LC	KEN	ORLANDO
VE3LU	CLAYT	KISSIMMEE
WB4OAR	MARTY	ORLANDO
WA4OPA	JOHN	ORLANDO
K1POT	LARRY	ORLANDO
W0RAO	ED	CASSELBERRY
WB4TRJ	ARNOLD	ORLANDO
KF4WM	JACK	WINTER PARK
K4YBB	JIM	OKEHUMPKA

PANAMA CITY AREA LAN

WD4FJE	VIRGINA	PANAMA CITY
WD4MAF	GLEN	PANAMA CITY
W4WEB	DICK	PORT ST. JOE
WA6QKN	DENNIS	PANAMA CITY BCH

PENSACOLA AREA LAN

KB4AR	BILL	PENSACOLA
K4LPT	STANLEY	MILLIGAN
KB4MD		PENSACOLA
KI4NQ	GARY	PENSACOLA

SEBRING AREA LAN
KE4PM-1 DIGIPEATER

N4APC	BOB	SEBRING
WA4IYY	CHARLIE	OKEECHOBEE
KE4PM	LARRY	AVON PARK

STUART AREA LAN
K4NTA-1 DIGIPEATER

WD4BRF	GEORGE	STUART
KB4HJM	GEORGE	FT PIERCE
KF4I	LARRY	JENSEN BCH
WD4KAV	JOE	STUART
W2KGV	LADO	PORT ST LUCIE
KA4LIF	THOM	STUART
K4NTA-2	TED	STUART
WA5RCX	RED	FT PIERCE
KA4VWW	GUY	STUART

TALLAHASSIE AREA LAN

N4FHO	RON	PANACEA
WB4LOQ	JOHN	TALLAHASSIE

TAMPA BAY AREA LAN
KC2FF-7 W. DIGIPEATER
W1BEL E. DIGIPEATER

N4AIY	STEVE	BRANDON
N4APG	BILL	SARASOTA
W1BEL	GWYN	BRANDON
KY4C	DAVE	TAMPA
KF4CW	ERNIE	TAMPA
W4DPH	JIM	CLEARWATER
N4DST	JERRY	ST. PETE
W9DVM	PHIL	TAMPA
KF4EF	PAT	TAMPA
W8EXG	PAUL	HOLIDAY
KC2FF	ANDY	CLEARWATER
KI4FH	BURT	TAMPA
WA4FIB	JACK	INDIAN ROCKS BCH
WB4GMA	JIM	TAMPA
K4HFL	ART	NEW PORT RICHEY
N4HWW	DAVE	ST. PETE
K4IGI	AL	ST. PETE
VE3ILW	LYMAN	TAMPA
WD4IXI	BILL	ST. PETE
N4IXU	BILL	BRANDON
N4KPU	HOWARD	WIMAUMA
KF4LG	BILL	BRANDON
WB3LGB	JOE	ST. PETE
WA3LKW	FRANK	SARASOTA
KB4LLO	DON	BRADENTON
WA4LLU	GLENN	TAMPA
KB9LT	COTTON	SPRING HILL
W4MJX	FRED	APOLLO BCH
WB4NCH	ANDA	TAMPA
KE4NL	BILL	SARASOTA
K4OQ	BOB	CLEARWATER
W4ORA	JIM	TAMPA
K4PT	ED	APOLLO BCH
WA3QFN	NEIL	CLEARWATER
K4RHD	BILL	SEMINOLE
KK4S	RAY	SARASOTA
W4SF	JOHN	CLEARWATER
K6TCS	FRANK	LARGO
WE4W	RICK	TAMPA
KA4WNZ	ART	TAMPA
KC4WV	DAN	SEMINOLE
WB8ZPE	BRAD	BRANDON
N4ZQ	KEITH	SEFFNER
KB4ZS	BILL	SEFFNER

WEST PALM BEACH LAN
WA4ARE-1 DIGIPEATER

KA6ADB	MARTIN	BOYNTON BCH
KJ4BX	STEVE	DELRAY BCH
K4CAJ	CECIL	LAKE PARK
WD4CWG	JEROME	W. PALM BCH
WA2DLI	GARY	W. PALM BCH
KA4EPS	LU	W. PALM BCH
WA4HXZ	HENRY	W. PALM BCH
WB4IQM	BOB	W. PALM BCH
WB4KGY	DOUG	W. PALM BCH
WD4KSO	KEN	LAKE WORTH
WD4KSN	JON	W. PALM BCH
WD4LHF	JIM	W. PALM BCH
KA4NOF	PHIL	W. PALM BCH
K2OZC	JOE	LAKE WORTH
W4PHL	PB EOC	W. PALM BCH
W1SL	TOM	LAKE WORTH
W4SS	MANNY	LAKE WORTH
KA4UTK		W. PALM BCH
W4UZJ	LLOYD	RIVIERA BCH
KE4VR	BOB	LAKE PARK
K4ZRP	LOU	JUPITER

Please submit suggestions for improvement and updates to the callsign listing.

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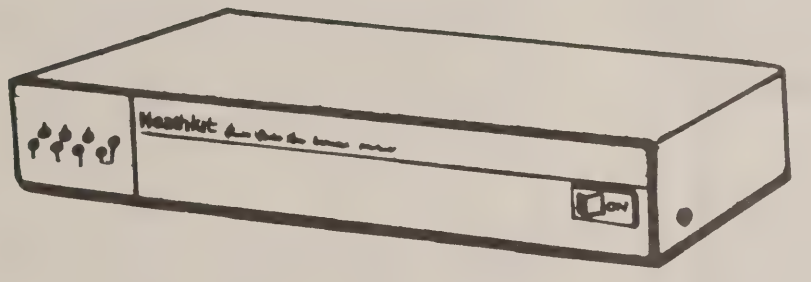

*** CONNECT

With The HD-4040

HD-4040 SPECIFICATIONS: Processor: 6809. **Clocks:** 7.3728 MHz crystal oscillator supplies signals to UART, switched capacitor filter, and E & Q systems. **Memory:** ROM, 32K (expandable to 48K), RAM, 8K (expandable to 24K). **Serial Port:** RS-232C interface to terminal or computer. Baud rates 50 to 1200 (optional to 4800). **Parallel Port:** Controller status and command channel and diagnostic signal port. **Non-volatile RAM:** 128 4-bit locations. **Protocols:** AX.25, VADCG. **Power:** 120V, 15 watts. **Dimensions:** 13-5/8" x 7-3/4" D x 2-3/8" H.

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BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

A week before the Dayton Hamfest when TAPR announced that they were selling out all of their remaining supply of TNC kits for $160.00 ot really caused the rumors to fly. Was TAPR getting out of the TNC busi ness? Well when the big announcement was made at Dayton about the TNC-2 things became clear. TNC-2 will be available in late summer for $185.00 in kit form. It uses a Z-80 CPU and runs from a 12 volt DC supply. Best of all is the software written by FADCA member Howie, N2WX. I am proud to have be able to help Howie with this project by testing the software with a version written for the Xerox 820 and FAD Board. As mentioned last month in the FADCA BEACON, This software is available from FADCA.

Lu, KA4EPS has his packet redio telephone BBS back on line. Lu's telephone BBS (305-969-0000) will allow hams with a special authorication code to patch from the telephone modem into his TNC and operate packet radio. This has given many local hams a chance to try out packet radio without purchasing a TNC and quite a few are on the air now with their own gear.

Don't forget Field Day this year. Packet radio will be permitted and the no repeater rule has been waved. One or more packet contacts during feld day will qualify for 100 additional bonus points. A packet station does not count as an additionaltransmitter. Indicate packet radio QSOs on the summary sheet as a separate band. This a great chance to show off packet radio to a large number of hams. Lets all contact our local field day groups and get make come connections. You don't have to make a contact with another field day station to have it count as a contact. Those of you who just stay home, please get on the air and give those of us that drag our rigs out in the woods a contact June 22-23.

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
305-723-8659

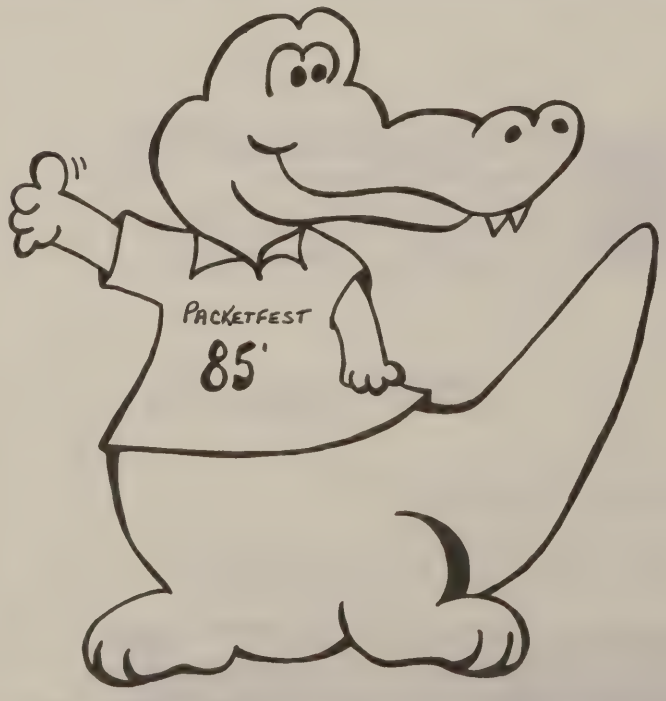
EMERGENCY COMMUNICATIONS

Comments from Steve Goode, K9NG via DRNET

On Saturday, April 20 the Chicago Area Packet Radio Association participated in a simulated emergency test in conjunction with the National Weather Service, the Northwest Illinois ARES and the Village of Hanover Park, Ill. At 9:35 am a simulated tornado touched down in Hanover Park creating a 100 yard path of destruction running diagonally thru the village. An Emergency Command center was set up at the Hanover Park police station under the command of the village chief of police. Liaison officers to the police and fire dept. and to the ham net were under the chief's command. Initial weather traffic and general damage estimates were handled on the 2 meter ARES voice nets.

Experiments were conducted using packet to replace all outgoing police calls with a packet link (all out going phone lines to the police station were jammed) and to use packet for health and welfare traffic between an emergency relocation center and the police station. Attempting to replace voice communications (the downed phone lines) with packet did not prove successful. Packet proved to be usable for the health and welfare traffic between the relocation center and the police station. All in all I think the test went very well especially when you consider that the packet stations were assembled the night before the drill. Two packet portable stations were provided for the links at the relocation center and the police station. A mobile digipeater was also provided just in case our main digipeater in Chicago would be taken off the air for the test or for placement between the two portable stations.

I think the main points brought out by the drill are the fact that an agreed upon connector standard for TNCs would be helpful for throwing together emergency packet stations (this is a point bought out by Bob Neuben 2 years ago). Also, a standard packet health and welfare form should be agreed upon and soft- ware should be written to allow easy entry in the field. An example of the use of this software would be to link emergency relocation centers, the morgue and a computer center. Lists of people at each center and the morgue could be kept at the central computer. Anyone looking for relatives would then ask the local relocation center to check the data base and see if they are at another center. I realize none of these observations are new but I would like to encour- age anyone thinking of writing sortware such as this. This software would require a lot of work and would hopefully never have to be used. By the way, the weather for the test was beautiful. A nice sunny day with temperatures in the 80's.



However you can get there...

DON'T MISS THE **'PACKETFEST'**

THE SOUTHNET PACKET CONFERENCE

U of FLORIDA, GAINESVILLE

JUNE 15 AND 16, 1985

Bring along packet and computer equipment for 'show and tell' and assistance with hookup and operation

NON - ELECTRONIC MAIL

1720 Virginia Court
Lakeland, FL 33803
15 May 1985

Dear Gwyn,

A few months ago you gave a talk on packet radio before the Heath Users' Group Computer Club in Tampa. (Your assistants were Pat, KF4EF and Don, KB4LLO.) I was so impressed with your demonstration of packet radio that I was determined to get a ham ticket, to become involved.

I now have my Technician's license. (I haven't yet been able to get up to 13 words per minute on the code.) I am ready to start buying equipment, and one of the purposes of this letter is to secure your advice on what gear to purchase to get started. I have a complete computer set-up with my Z-100.

.....I will shortly get my General license. I am sure of that-- learning code is not that tough....Any assistance you can provide would be greatly appreciated. After all, you provided the inspiration to get me started.

Sincerely,
Sam Gardner
(813) 646-1390

An Open Letter to TAPR TNC Owners

To owners of the world's most popular TNC: the original TAPR TNC kit (now called TNC 1).

At the 1985 Dayton Hamvention, TAPR unveiled TNC 2, a new terminal node controller. At the same time, we closed down production of our current kit board, TNC 1.

Does this mean you have been made the owner of a dinosaur, and will be forced to upgrade or go back to pounding brass? Will you be left behind for lack of software upgrades or protocol updates? Have you, in short, been abandoned?

No. Defintely not.

Packet radio is going through a tremendous period of growth. Several new vendors have entered the Amateur market. And all of the newest ones (AEA, Heath and Kantronics) are building equipment designed to be compatible with what you have. In addition to using the AX.25 protocol, these vendors use the TAPR command set and interface philosophy.

You own the standard.

We expect AEA, Heath and Kantronics to supply more new users with TNCs in the next year than there are packeteers now, so you won't lack for people to talk to. (In fact, Heath reports that they sold out their first three months production in 18 days!)

The Heath HD-4040 is an exact duplicate of what you own. Heath has announced their intention to provide several add-on products, including a status indicator (unveiled at Dayton) which attaches to the parallel port, and a modem tuning indicator for HF and Oscar 10 work. Heath has a stake in the future of Amateur radio, and they view packet radio as a way to get their primarily computer-oriented customers interested in Amateur Radio again.

AEA, Heath and Kantronics combined will be able to put far more resources toward advertising than TAPR can. TAPR will continue to provide technical articles to various Amateur Radio magazines, while these vendors and others will fill the in-between pages with advertising. More users mean more resources available to the packet community. This will result in even more technical innovation, network paths, and the ability to provide enhanced emergency sevices, aiding in our continuing quest to assure the existence of the Amateur Radio Service.

The new TAPR TNC is compatible with your unit as well. After all, you own the standard. TAPR is entering production of the K9NG high speed modem, designed to attach to the modem connector of your TNC as well as the new TNC 2.

What about the future?

TAPR is committed to providing continued software support. Release 4.0 of the TNC 1 software will provide all of the features of the initial release of TNC 2 software. TAPR recently shipped the Beta Upgrade Kit, designed to enable owners of the original beta test version of the first TAPR TNC to run the latest TNC 1 software.

We have a track record of support, and we intend to maintain it!

A final word. Remember, TAPR's charter is to perform R & D in the area of Amateur Packet Radio, not to be a manufacturer of TNCs. We use TNC sales to prove concepts and raise money to fund other development projects. That regular industry has "taken over" production of TNC 1 from us is a sign of the amazing success we have all shared in building a new market; it is not a sign that we are being pushed out or under cut.

We hope you share our feeling of accomplishment in the part we have all played in taking a mode which beagn in experimenter's garages in Canada, the U.S. and elsewhere, and making it a major part of the future of Amateur Radio.

And you ain't seen nothin' yet!

201 Highland St.
Valpariso, FL 32580
April 6, 1985

Dear Gwyn,

Here is a report of efforts toward getting some packet activity in northwest Florida.

My presentation to the Crestview Radio Club last night went well. About 20 people were there and the presentation was well received. I ran into a bit of skepticism at first, but that had changed to enthusiasm by the time I finished. Both reactions are easy for me to understand because they were my reactions as I listened to your pitch at the Ft. Walton Swapfest last month. I think we netted at least a couple of much needed converts.

Here is my conservative estimate of local activities for the next couple of months. I will show up on packet with the Heath TNC and 10 or 15 watts to a vertical at 40 ft around the end of April. About the same time K4LPT (Stan), WD4HDT (Bruce), K4PD (Ron) and maybe two or three other locals will place orders for the TNC of their choice. Mid-May should see increased pressure for a digipeater in the county as these stations become aware of their limited QSO options. By July we will have some kind of digipeateer and WD4HDT will have a bulletin board on the air.

If we can get access to a high enough tower we may be able to have a true "Panhandle LAN", at least on good days. Stations in Panama City could connect to stations here or in Pensacola. I suppose there will also be digipeater interest in those two cities, but I haven't actually heard it discussed yet. It would seem to make sense to put it in this general area because we are about midway between Panama City and Pensacola. I have four possible sites in mind, but no one of these will provide the desired coverage with absolute reliability. K4LPT, a member of the Crestview club, has already made inquiries about availability of space on the tower that the club now uses for their FM repeater (147.36/96). It is a 300 footer and the highest available for ham use in Okaloosa County. He has been told anywhere around 200 feet would be ok and this looks like the most promising for the moment.

A reliable gateway to GATOR-1 may still be a long way off. The maps tell me even Tallahassee is several hops away over sparsely populated terrain. That means we're probably talking big towers and big power and big antennas. I do think it is very important to pursue the concept, not just because it's fun, but also because isolation will stifle interest.

I have cranked up a voice net on the local repeater. I feel sure there are people other than myself in the area who have lots of questions and no one to address them to. In addition to filling this need, the net will keep everyone aware of what's going on in the local packet community and, probably most important, stimulate new interest.

Thanks again for the slides.

73,
Bill Bosley, K3NN

EXCERPTS FROM OTHER PUBLICATIONS

M 5176 Lyle Johnson (WA7GXD,2973) 4/21/85 12:19 AM

SUBJ:Network Node Controller

As I indicated at the ARRL Networking Conference, TAPR intends to develop a "Network Node Controller" for use in amateur packet radio. TAPR desires that this become a standard piece of hardware upon which a foundation can be built. We do not desire to stifle anyone's creativity -- however, this is the sort of device that will only be produced in relatively small numbers and it seems pointless to have multiple efforts going in parallel to produce this widget.

TAPR's Board of Directors identified this as a major effort for 1985 and TAPR will dedicate all resources at its disposal to help effect this design and get it in testing. TAPR recognizes that the development costs of this device (probably several tens of thousands of dollars) will not be recovered by sales of the device and is therefore expecting to "write off" this development...

The Network Node Controller (NNC) shall:
a) implement level three and level four protocols
b) have multiple physical level two channel capability
c) be capable of supporting at least two 56 kbps links
d) interface to its associated modems at RS422 or RS423
e) be sufficiently reliable to allow its use at remote sites
f) be designed around hardware that is generally supportable from the software development standpoint
g) be as simple as practical (KISS)
h) be as easily maintainable as practical

Please feel free to add to or modify the above list. To amplify the above points (and please note the questions are looking for minimum usable answers as opposed to wish list answers...):

a) Obviously the NNC must support level two. However, what we are really looking for is a box that can implement levels three and four. The hardware should be general enough, and powerful enough, to handle either the Virtual Circuit or the Datagram approach.

Question: How much Program storage space is needed for the various proposed protocols? How much data storage? Why?

Strawman: Eight bytewide sockets configurable for 8k/16k/32k byte (E)EPROMs for program storage. 256k bytes RAM for data and other temporary storage (including routing tables, etc.). RAM to be (CMOS) DRAM. This allows 8 times the capacity of the revered Xerox 820 board which everyone agreed last September could be made to support a minimal proof-of-concept version of the networking protocols.

Note that we are looking at a design that can be used for the envisioned backbone system now, perhaps retired to metropolitan feeder service later. We are not trying to design the ultimate system that can handle gigabit data rates nor act as a storage point. It is a device that provides a (smart) path for data.

Question: What processor is required to implement these protocol layers? Is multiprocessing required?

Strawman-A: Use a motherboard/daughterboard system. This allows flexibility for the future -- but at a cost of complexity and potential unreliability at the interfaces.

Use Z80 style devices for the channel controllers. A Z80/SIO approach could probably support a medium speed (56kbps) and a slower speed (up to 9600 bps) channel and handle the level two decisions. Give it 64k of memory. Perhaps use a device like the Hitachi 64180 CMOS processor (superset of Z80 plus two channel DMA, MMU, UART, DRAM refresh, clock, two 16-bit programmable timers, etc.).

For the motherboard, use an 8086-series device (80186?). This should have the address space to handle the requirements. It opens up the possibility of using the IBM PC as a development unit and the use of cheap faraday-like devices for some implementations. However, it uses sleazy card-edge connectors that just won't make it on a mountaintop or farmer john's silo that is eighty miles from nowhere...
(Also note: TAPR is not interested in making a general purpose computer...)

Strawman-B: Use a 68,000 with multichannel smart DMA for I/O. This provides a single processor environment. The 68k is smart enough to handle all the level two/three/four decisions, and the smart DMA controllers that are available for it greatly aid in these tasks. We aren't blessed with segments in this architecture, so the software tasks are eased. The single-board approach will be more reliable in the long run.

I offered two strawmen because these are the two suggestions that I heard most frequently. Comments? (unlike the code-free debacle, lets keep emotion out!!!)

b) the box should be configurable for two links minimum and eight links maximum. Either via plug-in daughter boards (A style) or empty IC sockets (B style).

c) handled under the appoaches discussed under a).

d) RS422/423 operate at 5-volt levels and are designed to handle higher data rates than RS232. The 5-volt levels may simplifiy the digital controller power supply (5-volt only).

e) reliability is more an issue of physical implementation than architecture; however a single processor MAY be somewhat easier to troubleshoot/repair than multiple processors. If the single processor system is simpler, it ought to be more reliable.

f) whatever procesor is chosen, development tools must be generally available at reasonable prices to run on popular computers (popular meaning amongst ourselves!). This means that the tools should run on an IBM PC or PClone. This isn't intended to force the 8086 family on the design; it is intended to avoid complications in software development due to very limited availability of tools (not everyone has a VAX in their basement, nor a 68k machine; most folks have access to a PC).

g) KISS should be adhered to in any design resulting from these discussions. One major point however, is related to co$t. This has to be an inexpensive box. Multibus or the current crop of VME bus modules are horrendously expensive. Remember, we have to buy these things and put them up all over the country before we have a network! The difference between $350 and $500 is non-trivial!

h) maintainability is a matter of implementation rather than architecture for the most part.

Finally, we need to recognize that the digital hardware is the simplest part of this while concept. RF decks and MODEMs are the hard part and will be addressed soon. For now, the Steve Goode 9600 bps system with the Chip Angle RF deck is proposed for initial use. An upscaled version of the same system may prove useful for higher data rates. Comments?

PACKET APPLICATIONS SOFTWARE
Dana Tremblay, WA1HUM
Reprinted from the NEPRA PacketEar, April 1985

For all you C freaks out there, there is an automated callbook program on W0RLI's drive B. Being a very lazy sort of person, I once got tired of constantly getting up to consult the printout of Hank's VHFCALLS.HRD and HFCALLS.HRD files tacked on the shack wall, when an unfamiliar call appeared on packet. So I wrote a lazyman's call look-up program that uses the two calls heard files concatenated together as the data base. I have since found this program VERY handy and use it constantly. Of course it requires a regularly updated data base to be effective, and Hank has been faithful in keeping it up to date. We should all try to help him here by keeping him up to date on our's and others activity. New stations take note, keep Hank abreast of where and who you are.

The program is pretty self-explanatory and was written for the MS-DOS environment, but should be able to be compiled for any DOS assuming the user has an appropriate compiler. I don't claim to be the greatest C programmer in the world, so give me a yell if you find a bug or two.

On a broader subject, we should all be thinking of what could be useful in the realm of packet applications software. I have since been doing a lot of work on a trace filter program. So far, the program is able to extract calls from a trace line. Since the calls extracted represent the channel activity complete with digipeaters, I hope to be able to put together a set of routines that can be used to monitor and model the network as heard from this QTH. By using operating system calls to my real-time clock, I will be able to add and delete calls, and their paths, in real time to a linked list that mimics the network. New stations could be added as they were heard and deleted if not heard for a while. While not the best system, (it has drawbacks, like having to be in trace mode for it to work) it is a first attempt at higher layer experimentation.

M 5302 Steve Goode (K9NG,2981) 4/21/85 7:39 PM

The third meeting of the CAPRA level 3 networking committee was held on April 18th at the home of WD9DBJ. Five of the eight committee members were present. Discussion centered on methods of implementing TCP/IP over the CAPRA test link between Indiana and Chicago. Information regarding the new QM-10 IC was reviewed as a possible solution. It was noted that plans to install the 220 Mhz radios and antennas for the link were proceeding on schedule. The link is expected to be operational sometime within the next two months.

Source code (in C Language) for TCP/IP will be acquired over a dial-up link within the next two weeks. Two committee members have accepted responsibility for reviewing the code for the purpose of identifying the changes required to make it suitable for packet radio use. The remaining members present are committed to contacting vendors in order to locate a source for 68000 base single-board micro-processers equipped to fill our needs.

M 15982 Harold Price (NK6K,2972) 5/21/85 1:15 AM

Now, from the same people that brought you the TNC Sale of the Century and TNC-2 comes another new concept in packet radio: "Old Business Days".

From Monday, May 20 through Friday, May 31, 9:00am until 5:30pm PST, TAPR will double its office staff and will disconnect the telephone recorder. During this time we have a human answering the phone, and we will be returning the backlog of calls that has built up.

So what exactly is "Old Business Days"? It's a marathon session during which we hope to clear out the last loose ends of the TNC- 1 product line. If you have any outstanding business with TAPR regarding any of the following items, we'd like to hear from you:

TNC-1 Kits
TNC-1 cabinet kits.
Beta Upgrade kits.
Outstanding spare parts orders.

We believe we have filled all outstanding orders except for a few items due to be sent overseas. If you have been waiting patiently for an item and have not received it, please call so we can make sure nothing has gone awry.

This is also your last chance to order any spare or replacement parts.

Please do not call on any of the following items:

Orders for TNC-2
New TNC-1 kit or Cabinet orders
9600 baud modems
orders for TNC-2
TNC interface questions
orders for TNC-2
TNC software or hardware interface or applications questions
orders for TNC-2

We want to get all of the TNC-1 business out of the way and would like the phone as clear as possible. If you are calling about a backlog order, please have the date of the transaction available and information on the method of payment. If you call after hours, you will get the phone machine. Please leave a number where you can be reached during the day.

Both TNC-2 and the 9600 baud modem boards are in beta test now. We will begin taking orders when they are available.

The TAPR phone number is (602) 746-1166.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

This column is near the end of the BEACON this month because it was written after the rest of the newsletter was composed. This issue is full of good news, all indicating that packet is alive and moving along rapidly.

I have a beta test TAPR TNC2 and I really like it. It took about 8 hours to assemble and test and that process was straightforward. (Some persons built them in as little as 3-4 hours.) The board has several physical advantages: smaller size than the TNC1 and operation from unregulated 12vdc. Both those factors make portable/mobile operation easy. Within 3 days of completeting the assembly and testing, I had my TNC2 in a briefcase with several gel cells, a handi-talkie, and a Model-100 portable computer. Worked back-seat mobile from Newark, NJ airport to the Poconos (no contacts), portable in a friend's house in Southern Jersey (worked WB2MNF BBS and K1HTV in Baltimore.) Then the most fun was portable operation from the terminal building at Newark Airport. Copied a lot of beacons, and worked the BBS again. Speaking of beacons, digipeater beacons were very useful in determining what stations were on the air and within range. They may annoy some locals, but they are invaluable to travellers.

There are several new and useful software features on the TNC2 (and the FADPAD software for the X-820). Connect and disconnect requests are displayed in monitor mode. No longer any need to go into trace mode to find out who is calling who. Also, digipeated frames are displayed with the complete routing and the station which transmitted the received frame is identified with an asterisk. Again, very useful for determining one's range of digipeating options. If some beacons are too frequent for your taste, place the call of the beaconing station on the 'lid list' and the transmissions from that station will no longer be displayed. Or you can toggle a flag and the lid list becomes the buddy list, providing preferential treatment to the display of frames from your 'buddies.' A calls heard log is implementeed in the monitor function too.

One of the slickest features is the Connect Message. When the function is enabled, another station connecting to the TNC2 will receive a preprogrammed (by you) message of up to 128 characters. Very helpful for implementing a buffer function for unattended operation. Both the connect text and the beacon text are preserved in the battery backed RAM when the TNC is powered down.

Kantronics has provided two Packet Communicators (KPC) for operational evaluation by FADCA. The two persons evaluating them are very pleased so far, and will report in the June BEACON. The KPC seems to be very easy to use on HF, and is fully compatible with other TNCs in all on the air operation.

The SOUTHNET PACKET CONFERENCE will be happening in short order. Preparations are not complete, but that is not a bad thing. Persons are volunteering additional ideas for seminars and activities, and also volunteering to help and lead discussions to the point that I have nearly lost track. The conference or 'packetfest' promises to be a busy, fun-filled two days and I encourage each of you to attend.

Lodging is still available in the UF student union. See last month's BEACON for details, or just call the union at (904) 392-1607. Be sure to mention you are with the Gator Amateur Radio Club. If you prefer to stay in a commercial motel, here are four to choose from: (All 904 area code)

Holiday Inn/University Center - 376-1661
Gainesville Hilton - 377-4000
Days Inn (I-75) - 376-1601
Econo Lodge (I-75) - 378-2346

We are still working on the motor home camping problem. The University policy is not to allow overnight occupancy of vehicles. The nearest 'full-hookup' campgrounds is 22 miles north of the city.

Friday evening there will be an informal meeting/pig-out at Godfather's Pizza Palace, NW 13th St and 23rd Ave. That is approximately 3 miles north of the campus. I'll be there at 7:30 PM, please join me. Talk-in frequency for the packetfest will be 146.91/31 which is the GARC club station. Alternate FM frequencies are 146.82 and 147.375. Naturally there will be packet activity on 145.01! The formal activity will begin Saturday at 9 AM and continue till 5 PM. Saturday evening we will have a dinner meeting, and Sunday, more seminars. Don't miss it!

The SOUTHNET map again appears in this issue. I would like to hear comments on the value of the map and callsign list, and the format we are using. I am very tempted to drop the callsign list because it is so hard to keep up with the explosive packet growth. Perhaps we can convert the map to show possible/favored digipeating routes in the SOUTHNET area. Your comments please.

Out of time and space...C U in Gainesville, or in these pages next month.

FADCA>BEACON

The FADCA>BEACON Is published monthly by the Florida Amateur Digital Communications Association, Inc. (FADCA), 812 Childers Loop, Brandon, FL 33511.

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...And lots of help from many others. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

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FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self addressed, stamped (4 ounces) 8 1/2 by 11 inch envelope to the FADCA address.To join, complete the membership application enclosed and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple
Half page	$17.00	issue contracts.
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a guaranteed monthly circulation of 250 copies, however that amount is normally doubled by introductory mailings and distribution at hamfests and demonstrations. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed:

January 1985	- 500	April 1985	- 500
February 1985	- 540	May 1985	- 500
March 1985	-1000		

The deadline for inputs for the JUNE issue of the FADCA > BEACON is JUNE 15th (turn in your inputs at the SOUTHNET Packet Conference). Articles should be in final form using a 55 character column width.

Any material appearing in the FADCA>BEACON may be reprinted without further permission if credit is given to the author and the BEACON.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

FLORIDA AMATEUR DIGITAL COMMUNICATIONS
ASSOCIATION, INCORPORATED (FADCA)
812 Childers Loop, Brandon, FL 33511

DON'T MISS THE 'PACKETFEST'
THE SOUTHNET PACKET CONFERENCE
U of FLORIDA, GAINESVILLE
JUNE 15 AND 16, 1985

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 5 Brandon, Florida May 1985

NEW PRODUCTS

The Kantronics Packet Communicator

Kantronics has created a new packet terminal node controller that makes getting on packet as easy as getting on RTTY. The unit is ready to use, easy to operate, and compatible with existing packet units. The new hardware design also includes features not found on other packet controllers, including a 1200 baud radio modem, transmit/receive control of square-wave test tones, and both Bell 103 and 202 tones. In addition, the unit is truly compact, measuring 1.9 by 5.9 by 8 inches in the "Kantronics" style extruded aluminum case.

A block diagram of the KPC is shown below. The 6803 microcomputer is the heart of the unit. Data from the 7910 World-Chip modem, your computer, and the EPROM, RAM, and NOVRAM memories feed it.

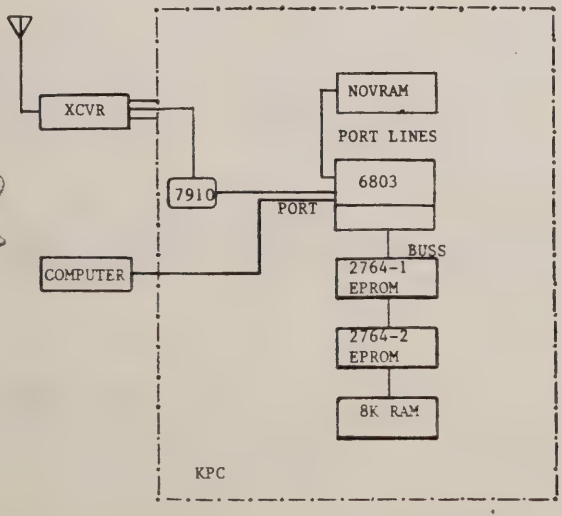
The 7910 modem interfaces with the 6803 via an I/O port. Your computer RS-232 lines and the NOVRAM also connect at the port. The two 2764 erasable programmable read-only memories (EPROMs) and the 8k byte RAM attach via the buss.

All control is under the supervision of the program in the EPROMs. In addition to responding to most of the same commands that other TNCs respond to, such as MYCALL, the KPC has several added commands: BELL, EQU, and CAL. The BELL command is used to configure the modem for Bell 103 or 202 tones. The 103 tones are used at 300 baud. The EQUalize command is used to adjust the modem at two different levels for the incoming AFSK tones. The CALibrate command is new, different from other TNC calibrates. It is used to transmit or receive a square-wave at 1200 baud. This tone transmission is very handy for use by two stations having it to tune to each other or for other tests.

Another plus of the KPC is that it is directly compatible with either RS-232 or TTL levels, thus making it unnecessary for you to get a TTL to RS-232 converter if you are u;sing a Commodore-64! The unit is shipped from the factory with the RS-232/TTL jumper set in the RS-232 position. You can change the jumper if you like; the circuitry is already in the box!

KANTRONICS PACKET COMMUNICATOR

BLOCK DIAGRAM



TAPR Announces TNC 2
or
The Rumors You Heard About Dayton Were True!

Tucson Amateur Packet Radio (TAPR) proudly announces a low-cost, no-compromise Terminal Node Controller (TNC), the TAPR TNC 2.

TNC 2 is a complete packet radio controller, incorporating the experience gained in supplying nearly 2500 TNCs to the world's Radio Amateurs.

TNC 2 utilizes the proven TAPR modem design with a switched capacitor input filter and plug-in headers to configure the on-board modem for various modes of operation, including 1200 baud, 1000 Hz shift and 300 baud, 200 Hz shift.

TNC 2 is based on a CMOS version of the popular Z80 microprocessor, and utilizes the Z80 SIO with a state machine to implement the HDLC NRZI packet format required by the AX.25 Level Two standard. The 8 k bytes of RAM are backed with a Lithium battery to retain all stored commands and operating parameters.

TNC 2 's software provides enhanced monitor mode, full support of the AX.25 Level two protocol, including Version 2.0, and other evolutionary features.

TNC 2 operates from a 12 volt dc (nominal) power source and is significantly smaller than the previous TAPR TNC (now called TNC 1).

TNC 2 is curently in field testing and is expected to be released during the summer. At a price of only $185 for the complete kit, including cabinet, high performance packet radio operation is now affordable by most Amateurs.

PLEASE NOTE: TAPR is not accepting orders for TNC 2 at this time. No waiting list is being maintained.

HF PACKET TUNING INDICATOR
J. W. Gregory, W4QF

The MFJ Model 1221 makes an excellent HF packet tuning indicator. Simply retune to frequencies of choice following the manual instructions. While the integral op-amp filters may not be quite idealized for this use, the unit works just fine.

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THE JUNKBOX

FADCA has obtained over 100 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The SCCs are now in stock for shipment.

FADCA has another shipment of Beehive B-152 terminals. These terminals are guaranteed to work when you get them (but keeping them working is your problem, HI). RS-232 port and auxiliary port, 80 x 24 display, many function keys, etc. Terminals receive upper and lower case, but may only transmit upper case unless modified. Documentation is available. $75.00 delivered to you at the SOUTHNET Packet Conference. P.S. One terminal is available that needs repair. Parts will be provided, but you have to diagnose and repair. Price negotiable. Call or write FADCA at published address.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

FADCA has a modem kit which provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. It was fully described in the March BEACON. The price is $8.95 which include shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

The original run of 100 boards is nearly gone. We will probably make another 100, but there might be a short delay awaiting production.

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 8 AM. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 7:30 PM. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 8 PM NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 8 PM. NCS: K4GFG
CRESTVIEW (Panhandle): 147.360 (+600) Sunday at 8:30 PM (after traffic net). NCS: K3NN
GAINESVILLE: 146.91 (-600) Monday at 8PM.
STUART: 147.060 (-600) Sunday at 8 PM.
WEST PALM BEACH CO: 147.285 (+600) Monday at 8 PM.

SOUTHNET statewide frequencies (Florida)

Primary LAN and calling freq:	145.010
Local QSOs & file xfers:	145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):	221.720, 221.780
Narrow bandwidth linking:	221.400 (20 KHz b/w)
Medium bandwidth linking :	220.570 (100 KHz b/w)

NON-REAL TIME GATEWAYS

COMPUSERVE HAMNET: W4PCM[75116,2607], N2WX [75006,702],
DIGITAL RADIO NET: K4NTA, N2WX, W1BEL
K4GPG

NEW GLB ADDRESS

GLB Electronics, Inc. is now located at 151 Commerce Parkway, Buffalo, NY 14224. (716) 675-6740.

DIGITAL EVENTS

JUNE 15/16. SOUTHNET Packet Conference, University of Florida, Gainesville.
JUNE 15-0100Z (JUNE 14th local date) North American Teleconference Radio Net, subject satellite communication.
JUNE 22/23. ARRL Field Day. Show off those portable packet stations.
JULY 6/7. Atlanta Hamfestival. Packet forum Saturday at 11 AM. Contact GRAPES.
AUG 3/4. Jacksonville Hamfest. Packet demonstration and FADCA dinner. Contact W4PCM.
OCT 12/13. South Florida ARRL Suncoast Convention (Clearwater Hamfest). Two full days of packet activities. Contact W1BEL.
FEB 8/9, 85. Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park. FADCA will host the 5th ARRL Computer Networking Conference and meeting of the ARRL Digital Committee.

NORTH AMERICAN TELECONFERENCE RADIO NETWORK

FRIDAY - JUNE 14TH, 1985 - 0100 ZULU (15TH)

With the declining sunspot cycle and the worst is yet to come, you will not want to miss the next North American Teleconference Radio Network on June 14th. New and exciting developments in the Amateur Radio space program will be reviewed. Basic information on how you can get started in satellite communications will be provided. Some of the topics to be covered include:

What are satellites?
How can they be used to QSO?
How can you get started?
How do the Amateur Satellites get built and launched?
Where can you go for help in getting started?
What kind of activities are planned for the future?

These, and many otherquestions you may have, will be addressed in teh teleconference. Many opportunites for questions and answers will be provided. No questions will be considered too basic, so if you have been trying to get stated in this area because you're frustrated with the present HF band conditions, now's you chance to get some help. Amsat will have some of its top volunteers available on the teleconference:

John Browning, W6SP
Tom Clark, W3IWI
Bill Tynan, W3XO
Jan King, W3GEY
Vern "Rip" Riportella, WA2LQQ
John Champa, K8OCL
Harold rice, NK6K

Don't miss this opportunity to learn more about the fantastic activities in the works in the Amateur Space Program. Under the direction of net manager WA0IVW - Tim Loewenstein, the net will begin at 9:00 P.M. June 14, 1985 on the following Florida repeaters:

Holly Hill - 147.158
Stuart - 147.060
Naples - 146.670
Gainesville - 146.820
West Palm Beach - 146.670
Orange Park - 46.670
Melbourne - 146.850
Davie - 146.790
Tarpon Springs - 488.800
Orlando - 146.760
Clearwater - 224.300
Panama City - 147.390

Note that persons arriving at the SOUTHNET Packet Conference on Friday will be able to hear the presentation at the informal pizza get together in Gainesville. See you there.

BBS AUTOFORWARDING

Hank Oredson, W0RLI
Reprinted from the NEPRA PacketEar, April 1985.

The following stations run BBSs of one nature or another. All are linked by way of automatic forwarding:

W0RLI	Westford, MA	KA1PN-1	North Canton, OH
K1BC	Lexington, MA	KE1G-1	Goffstown, NH
N1DKF	Cranston, RI	KA1T	Harvard, MA
W1AW-4	Newington, CT	WB1DSW	Manchester, NH
WA2RKN-2	Hyde Park, NY	WB2MNF	Medford, NJ
W3IWI	Clarksville, MD	KS3Q	Baltimore, MD
AK3P	Hummelstown, PA	KF4JF	Hahira, GA
WB4ZNW	Moultrie, GA	KI4XO	Marietta, GA
K7PYK	Scottsdale, AZ	WA4SZK	Florence, SC

XEROX 820 NEWS

EMERALD DOUBLE DENSITY CONVERSION FOR THE 820

Neil Earnhardt, WA3QFN

About a month ago I set out to bring my Xerox 820 big board up as a 64k CP/M computer. First I got the basic 820 working with the on-board monitor ROMS and was able to use it as a packet terminal with a very simple terminal program that called the built in monitor routines. However keying in even the 33 bytes required got to be a bore very quickly, therefore I set out to hook up some disc drives.

The first step was to bring up CP/M with the existing hardware and an eight inch Seimens FDD-1008D disc drive. My first attempt to this was only partly successful. The operating system booted just as the Xerox manual says but I could not do much more than get a directory. The problem is that the Seimens drives required a shorter step time than the Xerox is capable of providing. The software does have a byte that can be changed to modify the track-to-track step time however the Western Digital 1771 controller chip can only be programmed to a minimum of 6 ms which turned out to be not short enough for the Seimens drives. This caused them to jump past the desired track and not able to ever find the track it was looking for.

Previously Gwyn, W1BEL, had made a group purchase of Emerald double density adaptors for the 820. I was able to pick up one of the kits. Once I found the Siemens drives would not work, the Emerald project became top priority as it uses a WD 2793 controller which is capable of 3 mS step time. Also a quick look at the boot track software listing revealed that the user could select drives not only by size but also by speed. More on this later.

The Emerald Microware X120 double density conversion for the 820 consists of a 3.5 by 4.5 inch double sided P.C. board which plugs into the 820 where the 1771 controller and one other TTL gate used to be. The conversion kit also comes with two new monitor/boot roms and a disk with the CBIOS module of CP/M and some other useful utilities.

The Emerald manual is adequate to get the job done but is not a "Heathkit" type manual. I had to reread it a couple of times to fully understand everything that I needed to do. There are four slots available for bypass capacitors that are not mentioned in the assembly instructions. I used 0.1 uF ceramic caps here as is the normal practice on most digital boards. I would also recommend the "hard to find" parts kit also if you just buy the bare board. This includes the pots and caps needed except the bypasses noted above. There is some alignment needed so you will need someone to borrow an oscilloscope from. The alignment is very simple once you have the scope as there is a special test pin that is grounded to do the alignment.

The Emerald board allows simultaneous operation of both 5 and 8 inch disk drives in both single density or double density . The size selection is done with mini-jumpers on the PCB and also in the "boot" sector of the system disk. The "boot" sector is track 0 sector 1. This is called the "boot" sector as most CP/M systems use this track to load a small boot routine to get the system up and running. Emerald had the boot software in ROM so they use this track to hide away your custom hardware configuration. This track and I spent many hours together. As I mentioned earlier the Seimens 8 inch drives are very fussy about step times. I first brought my system up as a 8 inch single density system with 3 mS step times. It booted fine but would take a ridiculous amount of time to do simple things like a directory. I watched with great interest as the controller sent the head right off track 0 into non-formatted no-mans land. I finally decided to use a 6mS step time and discovered that all worked fine. (Why 6ms works here but not with the original controller is a mystery.) At times like this a utility called DUU (disk utility universal) came in real handy as it allows you to patch a sector on a disk one byte at a time. This allowed me to change the byte in the "boot" sector that controlled the step rate.

To create an Emerald system disk is very simple, mostly do to the fact that the software authors have included several "submit" files. To those of you unfamiliar with this a "submit" file is a list of commands in a file that is automatically stepped through by a program specifically intended for this purpose. It works just like you had typed in all the commands yourself. These submit files are set up to automatically bring together all of the necessary files into memory in preparation for system generation. Emerald actually provides a public domain version as some people might not have the Digital Research "submit" program.

It should be stated that it is necessary to have a CP/M system up and running to create your Emerald system disk. Emerald recommends using the 820 to generate a 8 inch system disk before making the modifications to the 820 board. I was unable to do this as I could not make the Siemens work on the 820 as it was. Therefore i had to make my first system disk on my old faithful IMSAI 8080 S-100 system. The instructions tell you to be sure that you have MOVCPM and DDT on your disk as well as the appropriate Emerald files for the type of system you want to create. These files would be a BOOT.HEX and a XBIOS.HEX for the type of system that you would like. The source code is provided for the BOOT and the XBIOS so that u can change them for your particular hardware. Also several versions of SYSGEN are also provided to actually write the system onto the system tracks of the destination disk.

Now that you have your system disks (make several just in case) safely put aside you are ready to make the modifications to the 820 itself. The instructions are specific here and do work if followed carefully. The most difficult part is that it is necessary to remove several chips from the board. This is most easily done with a good vacumm powered solder sucker which I was able to borrow at work. If you don't have one of these available it is best to cut the pins off the ICs and then desolder one leg at a time and remove it. The 1771's socket and three 16 pin chips must be removed. Two data bus buffers are removed and replaced with noninverting type buffers as the 2793 is inverted from what the 1771 was. The 7406 (u117) is removed and its socket is used to provide the Emerald board with additional signals. I used long wirewrap sockets on the Emerald board for J1 and J2 and then used the AP products female headers that Emerald recomends. This allows the Emerald board to just plug in piggyback style. This makes for a very nice installation. There are several other cuts and jumps that also must be made to the 820 board.

About the time I got the eight inchers working good I received some Shugart SA-465 DSQD 80 track drives from Priority One Electronics. They had a sale on them for 99 bucks each. I simply hooked these up with the 5 inch drive cable that I got with the 820 (original Xerox cable) and attempted to use them as drives C and D. However, the Xerox cable is wired through all the interconnects as A and B. Therefore I removed the select minijumps and ran a clip lead over to the drive from the DS3 to the drive select pin on the drive. This made the new 5 incher drive C. This was necessary so that I could make my 8 inch system operate long enough to generate a 5 inch system disk. I first formated a 80 track Kaypro 8 format disk with the Formatx utility. Then I ran the submit file that generates a 5 inch system on A and B and 8 inch on C and D. I patched the submit file so it would tell "sysgen" that the destination drive was drive C: (the 5 incher). Then all I had to do was remove the clip lead and place all my select minijumps to make the 5 inchers A and B, and the 8 inchers C and D. Then I hit the reset and up it came. My system is currently running as DSQD 5 inch with 784k storage on each 5 incher. I have not run double density on the eight inch disks yet as this requires modifing the Xerox board to 4 or 5 mhz due to the higher data rate that 8 inch DD requires. However Ray, KK4S, tells me that he has sucessfully changed his 820 to 5 mhz without any problems. It is necessary to replace the Z-80 family of chips with the faster A versions and the processor itself with the B version. This of course will mean more unsoldering of chips if you choose to do this. It is only necessary if you want 8 inch double density or just want the computer to run programs faster. With the two 5 inch at 784k that's 1.5 megabytes on line and I think that will do me for a while.

One other thing that the Emerald allows you the option on 5 inch drives is the motor on line. I hooked up an additional wire on my drives as the original cable did not have the "motor on" signal. I did not like the effect. The motor on line is not selective in its action. In other words, if it is active both 5 inch drive motors kick on. The way I have mine set now is that the Shugart drives as well as many others have optional "motor on when selected" jumpers. I placed that jumper in the drives and then only one drive motor was on at a time. However the thing never shut off as

Continued >>>

FADCA SQUELCH TALES

By Keith O'Brien, N4ZQ

Where to start? The past few weeks have seen so much going on in the Packet World, one does not know where to begin. With the HF band at it's lowest level the past month, and the same old voices on your local repeater, you would think that Ham Radio has all but dried up. Not so if you have been tuned in with the digital scene. New products, Dayton, digipeaters, incorporation, to name a few, are all worthy of headlines. What we hope to do this month is just briefly touch upon some of the side notes of the major recent events, and leave the details to the other articles.

With the Dayton hamfest of '85 now history, along came the major announcement from TAPR of a new TNC. Called the TNC-2, it's a Z80 based controller with a price tag reported at $185, including cabinet. But the real news behind all the glamour of the new product, is that FADCA's own Howard Goldstein, N2WX, is the author of TNC-2 software. Many of us who are operators of TNCs don't recognize the fact that someone had to write the operating system for the controller that we all take for granted. We just turn it on and expect it come up, without giving it a second thought. As if it was always there or just grew in the EPROM by itself. I guess we lose sight of the fact that the software was the culmination of ones sweat, tears, and many many hours of hard work. I for one am very proud, as all of FADCA should be, to have an exceptional individual like Howie in our ranks. I tip my hat to you N2WX, and along with that a sincere thanks for an outstanding job, well done! Howie's unselfish accomplishment also puts to final rest the old proverb "computers are dumber than people, but smarter than programmers".

As reported two months ago, Kantronics did reveal their Packet Communicator to the public at Dayton. Understand there are some very innovating design concepts in the Communicator. It's capable of software selecting either Bell 202 or 103 tones for 300 baud operation. This allows operation on a lower tone set for improved HF operation. Having had a 20 meter LSB packet set up, and knowing that signal tuning was very difficult, I was wondering how Kantronics was going to accomplish it. Especially since there are only 3 LEDs on the front panel labeled Power, Rcv, and Xmit. We understand that signal tuning is aided with a built in, software generated, on-screen frequency counter. Anyone who has ever tried to put a Packet signal thru the "Bird" could really appreciate that! Can't wait to see the Kantronics Packet Communicator in operation. That will not be long, because Kantronics is providing a pair of them for demonstration at the SOUTHNET Packet Conference in June. I will give a rundown on their use at that event.

Heathkit sold out of all 60 HD 4040's that they had along with them at Dayton, and that was the last of the initial production run of 500 units. Seems they underestimated the demand for it, and now a back order log jam exists. For those of us that own an original TAPR kit board, TNC-1 as it will now be known, and are running it in the nude, good news comes forth. Late word, just in, is that Heathkit will be putting a cabinet package together to accommodate us. Using the good looking, small profile Heath box, it should be a welcome addition. Not sure of the price yet, but understand it will be considerably less then the TAPR cabinet, which is no longer available. One problem that will have to be worked out is mountings for the TAPR power supply components, but nothing that a little ingenuity cannot take care of. Also hope the kit includes a new set of LEDs, as I flush mounted mine to the TAPR board. Heard that they only planning a run of 100 or so cabinets kits, but believe they could sell that many in Florida alone. Careful Heath, think you might be short again.

STANDARDIZATION! With the release of the new Packet hardware, to bad the amateur digital designers did not standardize the I/O connectors. I'm refering to the radio interface connectors on the TNCs. It's bad enough that we have to contend with different mike connectors on our rigs, but now we see a myriad of different types on the TNC end. Early TAPR Beta boards used a ribbon cable connector for rig interfacing. The orginal TNC-1 Kit used a DA-9 female 9 pin. Kantronics has chosen the 5 pin DIN connector as well as the new TNC-2. Bet you dollars to doughnuts, they are not wired the same. The point is that it would have been nice if anyones TNC could have been put on line with any other. Especially in an emergency situation, where I think the power of Packet lies once networking gets underway. The last thing one needs to worry about during a crisis, is whether their set up will interface with another's if it should fail or be replaced. Thank goodness the early pioneers of digital interfacing sat down and worked out a few standards. Or it be anyone's guess how their RS-232 is connected. Wish the Packet world had the foresight to attempt it.

Unfinished business. Last month we left off with a planned return trip to the Lake Wales, KE4PM-1, Digipeater site. A repeat trip was necessary do to the fact that PM-1 was experiencing a severe desence problem from W4KUM's RTTY MSO. We're happy to report that after an early Sunday morning tower climb by KE4PM and KB4CIA, moving the Digi antenna up another 70 feet cured the problem. The 4 bay array was also relocated to a north tower leg, to see if improved coverage to Orlando could be had. This small miracle was accomplished without adding any additional line loss to the system. Unfortunately moving the antenna caused a signal null to the lower southwest coast of the state without a real improvement toward the north. From my location due west of the site, it did increase the signal by 20 DB though. It looks like it will nicely fill the void from Tampa to the East coast LANs, during the daylight hours when no 120 mile path exists. Running only 20 watts from the old Motorola tube rig, improved performance could be realized if a solid state rig were found for the site.

A major revision to the digipeater path for the lower southeast coast has taken place. Word came just after the April Beacon went to press to make the correction. Last issue mentioned that Ft. Lauderdale's Digi W4LDP-1 would not be returning to the air, and to use WA1JOU in it's place. Well it seems that imformation was not correct either. The final word is that Ft. Lauderdale's LAN is to be replaced by the Hollywood LAN and and the Boca Raton LAN and to use WA4WHD-1 and WB4QNX-1 to bridge the gap. See the updated map included in this issue.

What could be a first for Florida, at least for central Florida took place earlier in the week of May 5th. Don, KB4LLO in Bradenton, established a two way connection with KB4FSK in Opp, Alabama! Using KF4TT-1 in Gainesville as the only digi, it marks the first known contact to our Southnet neighbors by a peninsular station. A planned digi is in the works for the panhandle in Crestview, Florida which will make reaching Alabama a little easier. Nice going guys!

A final word and a thanks to Dick, W4PCM from Jacksonville, for the work put forth in his efforts to get FADCA incorporated as a nonprofit organization. Not really sure of the legal ramification of it, but Webster's defines incorporated as "combined into one body or unit - united". And that we are!

See you in Gainesville, June 15 and 16, at the SOUTHNET PACKET FEST.

$49.... Keith

Continued from previous page.

the select never became inactive. I then discovered that Emerald provided for this with a jumper for "select when motor on". I enabled this feature and this deactivates the select lines whenever the motor on line times out. This also turns off the red LED on the drive.

The Emerald manual appears to have one error that Ray pointed out to me. The manual says that 5 inch drives do not need write precompensation. Ray found out the hard way that his did. He had several discussions with the folks out at Emerald and they agreed that many 5 inch drives do need it. I checked my manual for the Shugart 455/465 and it says to use it. Therefore check your manual for your particular drive.

The Emerald software provided does not include the source code for the two Boot/Monitor ROMS. I talked to Emerald about the availabilty of the source code and they said that it was written by the folks at Micro Cornucopia. They said they were supposed to receive it soon from them and then would make it available for sale. This is important to have in case you need to make any hardware changes or have other reasons to dig deep into the BIOS modules. The CBIOS that is provided makes extensive calls to the ROM module and I found myself several times wishing I new what it was doing in there.

I hope that this article has helped those of you who are about to buy or build an Emerald double density board. Let me know if you have any questions and I'll try to help out. Emerald Microware, P. O. Box 6118, Aloha, OR 97007. (503) 642-1860.

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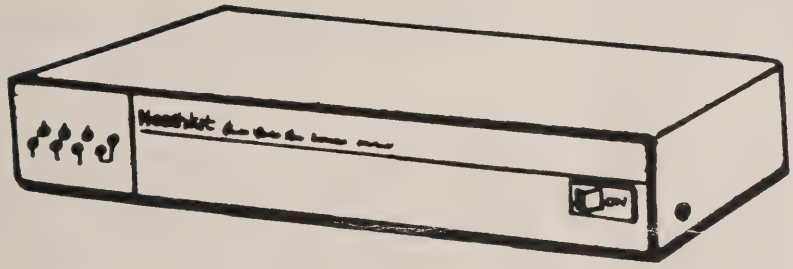

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GATOR - 1

9600 BAUD LINKING
Tom Kneisel, K4GFG

Thanks to K4OZS for a job well done in wirewrapping two K9NG modems. He did a very neat job, plus caught a few bugs in the design. I borrowed two TAPR TNC's and hooked in the 9600 baud modems. That was a simple matter of disconnecting the on-board 1200 baud modem by plugging into the disconnect socket J5. To make the TNC's run 9600 baud I connected J7 to the high speed clock side as Lyle Johnson wrote in PSR #12. I hooked the modems back to back (without radios) and presto, I was packeting at 9600 baud from one side of the dining room table to the other. The data waveforms all looked good, and the clock recovery state machine was hummig-along. There is a glitch in the carrier detect circuit however, which keeps the output frozen to a "1". I am investigating a solution.

The next step is to hook the Hamtronics 220 Mhz transceivers into the loop. That is proving more difficult than expected. Their transmitters will not operate at full power without spurious oscillation. Steve Goode had to detune his to a lower power level, and I am finding the same on the two that I have. But take heart, those of you with FM-5's. I own one, and we WILL find a solution to this problem. But until that solution is found, I do not recommend that packet groups run out and purchase the Hamtronics FM-5 for 220 Mhz linking, and I have begun a search for alternative radio gear. I expect to have the TNC's, modems, and radios all talking to each other at Gainesville. Come see just how fast 8 digipeats can be at 9600 baud!

CONNECT - The Beginners' Column

Don Deem, KB4LLO
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Bradenton, FL 33529
(813) 792-1853

This month has seen more and more new calls scrolling across my screen. In an effort to determine where all these new Packeteers were comming from, I attempted many connects. Fortunately I was successful and was able to meet N4APG, Bill in Sarasota, KB4FSK, Gill in Alabama and my old friend KI4FH, Bert in Tampa. I tried several others unsuccessfully and will try again as the opportunity presents itself. Several things became clear to me as a result of these contacts and others I have made in the past; we beginners all have a common problem. We are on the air finally, eager to burn up the airways, but we don't know how! In this column I will attempt to clear up some of the questions I've heard.

I'm sure that most of you have heard the discussions concerning BEACONS and the CWID. In fact these features of the TAPR kit board, the AEA board, and the Heath HD-4040, are user options.I have discussed these items with several packet people, some are against using both of them, others feel strongly that both are necessary. Common sense tells me that the beacon is a very useful tool for the beginner, because it lets him know who is on frequency available for conversation. I think that the repetition rate should be determined by the activity on the particular frequency on which you are operating. If activity is high then reduce your beacon rate. The CWID is no longer an FCC requirement. If you wish to use it, do so with discretion. Let us know your feelings on these two options.

It seems that we have a substantial number of new people who are apartment dwellers, and as you might imagine, have antenna difficulties. KI4FH, Bert, (Tampa) recently moved into an apartment and was having all kinds of signal problems operating with a mobile 5/8s mag mount located in the middle of his water bed. W4APV, Jim suggested he move the antenna to the refrig erator to provide some ground plane. In the process Bert recalled how KF4EF, Pat had solved a similiar situation at a demonstration held at the Tampa Heath-Zenith store when Pat turned the antenna upside down and fastened it to some metal ceiling support. So Burt attached the mag mount to the rain gutter outside his second story window. As a result I was able to copy Bert S-9 forty+ miles away.Now Bert is heard everywhere. The point is that you don't need a huge antenna system to get on packet, just enough to digipeat through a neighbor that does. Remember, all packet stations are potential digipeaters.

The TAPR TNC kit board (now called the TNC-1), includ ing the the Heath and AEA versions, has three operating modes. The COMMAND mode is the mode from which you enter all commands that alter the TNC's operating parameters. This is the mode from which you initiate a CONNECT to some other station. Once you have connected, the TNC automatically goes to the CONVERSE mode (no prompt symbol) and you are ready to communicate. Now in order to return to the COMMAND mode, you must hold the CTRL key and simultaneously press the C key. The CMD prompt on your screen tells you that you are now in the COMMAND mode. Now, assuming that you have made the parameter changes you wanted, and you now wish to continue with your conversation, type CONVERSE (short form CONV) and C/R or ENTER and you will be in the CONVERSE mode. The third mode is the TRANSPARENT mode. This mode is primarily used to transfer large amounts of data between computers and is generally of little interest to beginners. The TRANSPARENT mode and data transfers will be the topic covered in a future CONNECT column.

As far as I know, there are no formalized operating procedures for packet radio operation, but here are a few DO's and DON'Ts that may seem obvious because they reflect good radio operating procedure:

1.You don't have to ask permission to digipeat through someone. You will not interfere with his operation.

2. If you CONNECT to a station 'saving connects', or any other station, be sure to disconnect when you are finished. If you don't you leave his station locked up. NOTE: The 'double disconnect' is a term for giving the DISCONNECT command twice in sequence. That causes your TNC to become disconnected without receiving acknowlegement from the other TNC. Thus the other TNC is left connected until that operator corrects the situation. Only use the 'double disconnect' when the other station has 'retried out' and your TNC cannot get a disconnect acknowlegement.

3. Don't attempt to utilize a BBS during 'prime time' until you have become familiar with its operaton. BBSs really tie up a channel and operators should not have lengthy sessions during busy operating times.

4. If you try a CONNECT and don't make it, try another route or wait for more favorable conditions. Don't set your RETRY to 0 and bang away all evening. In fact, it is a good practice to test for a good path by trying a connect to your own callsign via the route of digipeaters to your intended destination and back. That way you can determine if propagation will support the path you desire. If you just try the connect initially, you may get a connect frame to the other end but never get his connect acknowlegement back. You will think the signal never got to the other end, when, in fact, you have locked up the other TNC in a connected state. (A pending software update will cause the locked TNC to 'time out' of the connected state after 5 minutes.)

5. Limit your use of the CTRL G (Bell), because you 'ding' every terminal in the LAN when you use it.

6. Turn your CWID OFF when you don't intend to use it.

7. When the band is busy, keep your beacon repetition to a minimum.

BROWARD NEWS
Tom Kneisel, K4GFG

Many newcomers are showing up on the Gold Coast, most recently WB4EJE, KA4HLO, KA4RPD, W4QF, N4DEV, and WW4V. WA4WUP has a new Heath TNC on the air and K4OZC is building one. W2IDX has a TAPR TNC on the way.

K4SLF is interested in sending digital video by packet, and says that a 256 X 192 image will take less than one minute at 1200 baud. (I suppose that's if there are no digipeaters in the loop!)

The Hollywood digipeater WA4WHD-1 is now on the air thanks to Ed, W4FQM. Ed operates the local 146.70 RTTY machine, and has taken a liking to packet as well. The link is solid to the W4NVU digipeater in Miami. Many Miami packeteers find they can reach W4WHD-1 directly. To the north coverage is good throughout Broward County and the link to the Boca digipeater is expected to be solid.

That's what everyone is anxiously awaiting.....the Boca digipeater by the IBM ARC. WA2HFA is putting the final touches on the TAPR TNC, and expects to have WB4QNX-1 digi on the air about the time you read this. That should give Southnet a solid, reliable link from West Palm to Miami. Finally we will bring the active Miami group into touch with the rest o the state! Try bouncing a few packets down the WA4ARE-1, WB4QNX-1, WA4WHD-1,W4NVU pipe.

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Volume one (1984) back issues of the FADCA>BEACON are available for reproduction and mailing costs of $.75 per issue, or $5.00 for the entire year (11 issues). Send your request to the FADCA address.

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

A week before the Dayton Hamfest when TAPR announced that they were selling out all of their remaining supply of TNC kits for $160.00 ot really caused the rumors to fly. Was TAPR getting out of the TNC business? Well when the big announcement was made at Dayton about the TNC-2 things became clear. TNC-2 will be available in late summer for $185.00 in kit form. It uses a Z-80 CPU and runs from a 12 volt DC supply. Best of all is the software written by FADCA member Howie, N2WX. I am proud to have be able to help Howie with this project by testing the software with a version written for the Xerox 820 and FAD Board. As mentioned last month in the FADCA BEACON, This software is available from FADCA.

Lu, KA4EPS has his packet redio telephone BBS back on line. Lu's telephone BBS (305-969-0000) will allow hams with a special authorication code to patch from the telephone modem into his TNC and operate packet radio. This has given many local hams a chance to try out packet radio without purchasing a TNC and quite a few are on the air now with their own gear.

Don't forget Field Day this year. Packet radio will be permitted and the no repeater rule has been waived. One or more packet contacts during feld day will qualify for 100 additional bonus points. A packet station does not count as an additionaltransmitter. Indicate packet radio QSOs on the summary sheet as a separate band. This a great chance to show off packet radio to a large number of hams. Lets all contact our local field day groups and get make come connections. You don't have to make a contact with another field day station to have it count as a contact. Those of you who just stay home, please get on the air and give those of us that drag our rigs out in the woods a contact June 22-23.

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
305-723-8659

EMERGENCY COMMUNICATIONS

Comments from Steve Goode, K9NG via DRNET

On Saturday, April 20 the Chicago Area Packet Radio Association participated in a simulated emergency test in conjunction with the National Weather Service, the Northwest Illinois ARES and the Village of Hanover Park, Ill. At 9:35 am a simulated tornado touched down in Hanover Park creating a 100 yard path of destruction running diagonally thru the village. An Emergency Command center was set up at the Hanover Park police station under the command of the village chief of police. Liaison officers to the police and fire dept. and to the ham net were under the chief's command. Initial weather traffic and general damage estimates were handled on the 2 meter ARES voice nets.

Experiments were conducted using packet to replace all outgoing police calls with a packet link (all out going phone lines to the police station were jammed) and to use packet for health and welfare traffic between an emergency relocation center and the police station. Attempting to replace voice communications (the downed phone lines) with packet did not prove successful. Packet proved to be usable for the health and welfare traffic between the relocation center and the police station. All in all I think the test went very well especially when you consider that the packet stations were assembled the night before the drill. Two packet portable stations were provided for the links at the relocation center and the police station. A mobile digipeater was also provided just in case our main digipeater in Chicago would be taken off the air for the test or for placement between the two portable stations.

I think the main points brought out by the drill are the fact that an agreed upon connector standard for TNCs would be helpful for throwing together emergency packet stations (this is a point bought out by Bob Neuben 2 years ago). Also, a standard packet health and welfare form should be agreed upon and software should be written to allow easy entry in the field. An example of the use of this software would be to link emergency relocation centers, the morgue and a computer center. Lists of people at each center and the morgue could be kept at the central computer. Anyone looking for relatives would then ask the local relocation center to check the data base and see if they are at another center. I realize none of these observations are new but I would like to encourage anyone thinking of writing sortware such as this. This software would require a lot of work and would hopefully never have to be used. By the way, the weather for the test was beautiful. A nice sunny day with temperatures in the 80's.

However you can get there...

DON'T MISS THE **'PACKETFEST'**

THE SOUTHNET PACKET CONFERENCE

U of FLORIDA, GAINESVILLE

JUNE 15 AND 16, 1985

Bring along packet and computer equipment for 'show and tell' and assistance with hookup and operation

NON - ELECTRONIC MAIL

1720 Virginia Court
Lakeland, FL 33803
15 May 1985

Dear Gwyn,

A few months ago you gave a talk on packet radio before the Heath Users' Group Computer Club in Tampa. (Your assistants were Pat, KF4EF and Don, KB4LLO.) I was so impressed with your demonstration of packet radio that I was determined to get a ham ticket, to become involved.

I now have my Technician's license. (I haven't yet been able to get up to 13 words per minute on the code.) I am ready to start buying equipment, and one of the purposes of this letter is to secure your advice on what gear to purchase to get started. I have a complete computer set-up with my Z-100.

.....I will shortly get my General license. I am sure of that-- learning code is not that tough....Any assistance you can provide would be greatly appreciated. After all, you provided the inspiration to get me started.

Sincerely,
Sam Gardner
(813) 646-1390

An Open Letter to TAPR TNC Owners

To owners of the world's most popular TNC: the original TAPR TNC kit (now called TNC 1).

At the 1985 Dayton Hamvention, TAPR unveiled TNC 2, a new terminal node controller. At the same time, we closed down production of our current kit board, TNC 1.

Does this mean you have been made the owner of a dinosaur, and will be forced to upgrade or go back to pounding brass? Will you be left behind for lack of software upgrades or protocol updates? Have you, in short, been abandoned?

No. Defintely not.

Packet radio is going through a tremendous period of growth. Several new vendors have entered the Amateur market. And all of the newest ones (AEA, Heath and Kantronics) are building equipment designed to be compatible with what you have. In addition to using the AX.25 protocol, these vendors use the TAPR command set and interface philosophy.

You own the standard.

We expect AEA, Heath and Kantronics to supply more new users with TNCs in the next year than there are packeteers now, so you won't lack for people to talk to. (In fact, Heath reports that they sold out their first three months production in 18 days!)

The Heath HD-4040 is an exact duplicate of what you own. Heath has announced their intention to provide several add-on products, including a status indicator (unveiled at Dayton) which attaches to the parallel port, and a modem tuning indicator for HF and Oscar 10 work. Heath has a stake in the future of Amateur radio, and they view packet radio as a way to get their primarily computer-oriented customers interested in Amateur Radio again.

AEA, Heath and Kantronics combined will be able to put far more resources toward advertising than TAPR can. TAPR will continue to provide technical articles to various Amateur Radio magazines, while these vendors and others will fill the in-between pages with advertising. More users mean more resources available to the packet community. This will result in even more technical innovation, network paths, and the ability to provide enhanced emergency sevices, aiding in our continuing quest to assure the existence of the Amateur Radio Service.

The new TAPR TNC is compatible with your unit as well. After all, you own the standard. TAPR is entering production of the K9NG high speed modem, designed to attach to the modem connector of your TNC as well as the new TNC 2.

What about the future?

TAPR is committed to providing continued software support. Release 4.0 of the TNC 1 software will provide all of the features of the initial release of TNC 2 software. TAPR recently shipped the Beta Upgrade Kit, designed to enable owners of the original beta test version of the first TAPR TNC to run the latest TNC 1 software.

We have a track record of support, and we intend to maintain it!

A final word. Remember, TAPR's charter is to perform R & D in the area of Amateur Packet Radio, not to be a manufacturer of TNCs. We use TNC sales to prove concepts and raise money to fund other development projects. That regular industry has "taken over" production of TNC 1 from us is a sign of the amazing success we have all shared in building a new market; it is not a sign that we are being pushed out or under cut.

We hope you share our feeling of accomplishment in the part we have all played in taking a mode which beagn in experimenter's garages in Canada, the U.S. and elsewhere, and making it a major part of the future of Amateur Radio.

And you ain't seen nothin' yet!

201 Highland St.
Valpariso, FL 32580
April 6, 1985

Dear Gwyn,

Here is a report of efforts toward getting some packet activity in northwest Florida.

My presentation to the Crestview Radio Club last night went well. About 20 people were there and the presentation was well received. I ran into a bit of skepticism at first, but that had changed to enthusiasm by the time I finished. Both reactions are easy for me to understand because they were my reactions as I listened to your pitch at the Ft. Walton Swapfest last month. I think we netted at least a couple of much needed converts.

Here is my conservative estimate of local activities for the next couple of months. I will show up on packet with the Heath TNC and 10 or 15 watts to a vertical at 40 ft around the end of April. About the same time K4LPT (Stan), WD4HDT (Bruce), K4PD (Ron) and maybe two or three other locals will place orders for the TNC of their choice. Mid-May should see increased pressure for a digipeater in the county as these stations become aware of their limited QSO options. By July we will have some kind of digipeateer and WD4HDT will have a bulletin board on the air.

If we can get access to a high enough tower we may be able to have a true "Panhandle LAN", at least on good days. Stations in Panama City could connect to stations here or in Pensacola. I suppose there will also be digipeater interest in those two cities, but I haven't actually heard it discussed yet. It would seem to make sense to put it in this general area because we are about midway between Panama City and Pensacola. I have four possible sites in mind, but no one of these will provide the desired coverage with absolute reliability. K4LPT, a member of the Crestview club, has already made inquiries about availability of space on the tower that the club now uses for their FM repeater (147.36/96). It is a 300 footer and the highest available for ham use in Okaloosa County. He has been told anywhere around 200 feet would be ok and this looks like the most promising for the moment.

A reliable gateway to GATOR-1 may still be a long way off. The maps tell me even Tallahassee is several hops away over sparsely populated terrain. That means we're probably talking big towers and big power and big antennas. I do think it is very important to pursue the concept, not just because it's fun, but also because isolation will stifle interest.

I have cranked up a voice net on the local repeater. I feel sure there are people other than myself in the area who have lots of questions and no one to address them to. In addition to filling this need, the net will keep everyone aware of what's going on in the local packet community and, probably most important, stimulate new interest.

Thanks again for the slides.

73,
Bill Bosley, K3NN

EXCERPTS FROM OTHER PUBLICATIONS

M 5176 Lyle Johnson (WA7GXD,2973) 4/21/85 12:19 AM

SUBJ:Network Node Controller

As I indicated at the ARRL Networking Conference, TAPR intends to develop a "Network Node Controller" for use in amateur packet radio. TAPR desires that this become a standard piece of hardware upon which a foundation can be built. We do not desire to stifle anyone's creativity -- however, this is the sort of device that will only be produced in relatively small numbers and it seems pointless to have multiple efforts going in parallel to produce this widget.

TAPR's Board of Directors identified this as a major effort for 1985 and TAPR will dedicate all resources at its disposal to help effect this design and get it in testing. TAPR recognizes that the development costs of this device (probably several tens of thousands of dollars) will not be recovered by sales of the device and is therefore expecting to "write off" this development...

The Network Node Controller (NNC) shall:
a) implement level three and level four protocols
b) have multiple physical level two channel capability
c) be capable of supporting at least two 56 kbps links
d) interface to its associated modems at RS422 or RS423
e) be sufficiently reliable to allow its use at remote sites
f) be designed around hardware that is generally supportable from the software development standpoint
g) be as simple as practical (KISS)
h) be as easily maintainable as practical

Please feel free to add to or modify the above list. To amplify the above points (and please note the questions are looking for minimum usable answers as opposed to wish list answers...):

a) Obviously the NNC must support level two. However, what we are really looking for is a box that can implement levels three and four. The hardware should be general enough, and powerful enough, to handle either the Virtual Circuit or the Datagram approach.

Question: How much Program storage space is needed for the various proposed protocols? How much data storage? Why?

Strawman: Eight bytewide sockets configurable for 8k/16k/32k byte (E)EPROMs for program storage. 256k bytes RAM for data and other temporary storage (including routing tables, etc.). RAM to be (CMOS) DRAM. This allows 8 times the capacity of the revered Xerox 820 board which everyone agreed last September could be made to support a minimal proof-of-concept version of the networking protocols.

Note that we are looking at a design that can be used for the envisioned backbone system now, perhaps retired to metropolitan feeder service later. We are not trying to design the ultimate system that can handle gigabit data rates nor act as a storage point. It is a device that provides a (smart) path for data.

Question: What processor is required to implement these protocol layers? Is multiprocessing required?

Strawman-A: Use a motherboard/daughterboard system. This allows flexibility for the future -- but at a cost of complexity and potential unreliability at the interfaces.

Use Z80 style devices for the channel controllers. A Z80/SIO approach could probably support a medium speed (56kbps) and a slower speed (up to 9600 bps) channel and handle the level two decisions. Give it 64k of memory. Perhaps use a device like the Hitachi 64180 CMOS processor (superset of Z80 plus two channel DMA, MMU, UART, DRAM refresh, clock, two 16-bit programmable timers, etc.).

For the motherboard, use an 8086-series device (80186?). This should have the address space to handle the requirements. It opens up the possibility of using the IBM PC as a development unit and the use of cheap faraday-like devices for some implementations. However, it uses sleazy card-edge connectors that just won't make it on a mountaintop or farmer john's silo that is eighty miles from nowhere...
(Also note: TAPR is not interested in making a general purpose computer...)

Strawman-B: Use a 68,000 with multichannel smart DMA for I/O. This provides a single processor environment. The 68k is smart enough to handle all the level two/three/four decisions, and the smart DMA controllers that are available for it greatly aid in these tasks. We aren't blessed with segments in this architecture, so the software tasks are eased. The single-board approach will be more reliable in the long run.

I offered two strawmen because these are the two suggestions that I heard most frequently. Comments? (unlike the code-free debacle, lets keep emotion out!!!)

b) the box should be configurable for two links minimum and eight links maximum. Either via plug-in daughter boards (A style) or empty IC sockets (B style).

c) handled under the appoaches discussed under a).

d) RS422/423 operate at 5-volt levels and are designed to handle higher data rates than RS232. The 5-volt levels may simplifiy the digital controller power supply (5-volt only).

e) reliability is more an issue of physical implementation than architecture; however a single processor MAY be somewhat easier to troubleshoot/repair than multiple processors. If the single processor system is simpler, it ought to be more reliable.

f) whatever procesor is chosen, development tools must be generally available at reasonable prices to run on popular computers (popular meaning amongst ourselves!). This means that the tools should run on an IBM PC or PClone. This isn't intended to force the 8086 family on the design; it is intended to avoid complications in software development due to very limited availability of tools (not everyone has a VAX in their basement, nor a 68k machine; most folks have access to a PC).

g) KISS should be adhered to in any design resulting from these discussions. One major point however, is related to co$t. This has to be an inexpensive box. Multibus or the current crop of VME bus modules are horrendously expensive. Remember, we have to buy these things and put them up all over the country before we have a network! The difference between $350 and $500 is non-trivial!

h) maintainability is a matter of implementation rather than architecture for the most part.

Finally, we need to recognize that the digital hardware is the simplest part of this while concept. RF decks and MODEMs are the hard part and will be addressed soon. For now, the Steve Goode 9600 bps system with the Chip Angle RF deck is proposed for initial use. An upscaled version of the same system may prove useful for higher data rates. Comments?

PACKET APPLICATIONS SOFTWARE
Dana Tremblay, WA1HUM
Reprinted from the NEPRA PacketEar, April 1985

For all you C freaks out there, there is an automated callbook program on W0RLI's drive B. Being a very lazy sort of person, I once got tired of constantly getting up to consult the printout of Hank's VHFCALLS.HRD and HFCALLS.HRD files tacked on the shack wall, when an unfamiliar call appeared on packet. So I wrote a lazy-man's call look-up program that uses the two calls heard files concatenated together as the data base. I have since found this program VERY handy and use it constantly. Of course it requires a regularly updated data base to be effective, and Hank has been faithful in keeping it up to date. We should all try to help him here by keeping him up to date on our's and others activity. New stations take note, keep Hank abreast of where and who you are.

The program is pretty self-explanatory and was written for the MS-DOS environment, but should be able to be compiled for any DOS assuming the user has an appropriate compiler. I don't claim to be the greatest C programmer in the world, so give me a yell if you find a bug or two.

On a broader subject, we should all be thinking of what could be useful in the realm of packet applications software. I have since been doing a lot of work on a trace filter program. So far, the program is able to extract calls from a trace line. Since the calls extracted represent the channel activity complete with digipeaters, I hope to be able to put together a set of routines that can be used to monitor and model the network as heard from this QTH. By using operating system calls to my real-time clock, I will be able to add and delete calls, and their paths, in real time to a linked list that mimics the network. New stations could be added as they were heard and deleted if not heard for a while. While not the best system, (it has drawbacks, like having to be in trace mode for it to work) it is a first attempt at higher layer experimentation.

M 5302 Steve Gould F9NG,2981) 4/21/85 7:39 PM

The third meeting of the CAPRA level 3 networking committee was held on April 18th at the home of WD9DBJ. Five of the eight committee members were present. Discussion centered on methods of implementing TCP/IP over the CAPRA test link between Indiana and Chicago. Information regarding the new QM-10 IC was reviewed as a possible solution. It was noted that plans to install the 220 Mhz radios and antennas for the link were proceeding on schedule. The link is expected to be operational sometime within the next two months.

Source code (in C Language) for TCP/IP will be acquired over a dial-up link within the next two weeks. Two committee members have accepted responsibility for reviewing the code for the purpose of identifying the changes required to make it suitable for packet radio use. The remaining members present are committed to contacting vendors in order to locate a source for 68000 base single-board micro-processers equipped to fill our needs.

M 15982 Harold Price (NK6K,2972) 5/21/85 1:15 AM

Now, from the same people that brought you the TNC Sale of the Century and TNC-2 comes another new concept in packet radio: "Old Business Days".

From Monday, May 20 through Friday, May 31, 9:00am until 5:30pm PST, TAPR will double its office staff and will disconnect the telephone recorder. During this time we have a human answering the phone, and we will be returning the backlog of calls that has built up.

So what exactly is "Old Business Days"? It's a marathon session during which we hope to clear out the last loose ends of the TNC- 1 product line. If you have any outstanding business with TAPR regarding any of the following items, we'd like to hear from you:

TNC-1 Kits
TNC-1 cabinet kits.
Beta Upgrade kits.
Outstanding spare parts orders.

We believe we have filled all outstanding orders except for a few items due to be sent overseas. If you have been waiting patiently for an item and have not received it, please call so we can make sure nothing has gone awry.

This is also your last chance to order any spare or replacement parts.

Please do not call on any of the following items:

Orders for TNC-2
New TNC-1 kit or Cabinet orders
9600 baud modems
orders for TNC-2
TNC interface questions
orders for TNC-2
TNC software or hardware interface or applications questions
orders for TNC-2

We want to get all of the TNC-1 business out of the way and would like the phone as clear as possible. If you are calling about a backlog order, please have the date of the transaction available and information on the method of payment. If you call after hours, you will get the phone machine. Please leave a number where you can be reached during the day.

Both TNC-2 and the 9600 baud modem boards are in beta test now. We will begin taking orders when they are available.

The TAPR phone number is (602) 746-1166.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

This column is near the end of the BEACON this month because it was written after the rest of the newsletter was composed. This issue is full of good news, all indicating that packet is alive and moving along rapidly.

I have a beta test TAPR TNC2 and I really like it. It took about 8 hours to assemble and test and that process was straightforward. (Some persons built them in as little as 3-4 hours.) The board has several physical advantages: smaller size than the TNC1 and operation from unregulated 12vdc. Both those factors make portable/mobile operation easy. Within 3 days of completeting the assembly and testing, I had my TNC2 in a briefcase with several gel cells, a handi-talkie, and a Model-100 portable computer. Worked back-seat mobile from Newark, NJ airport to the Poconos (no contacts), portable in a friend's house in Southern Jersey (worked WB2MNF BBS and K1HTV in Baltimore.) Then the most fun was portable operation from the terminal building at Newark Airport. Copied a lot of beacons, and worked the BBS again. Speaking of beacons, digipeater beacons were very useful in determining what stations were on the air and within range. They may annoy some locals, but they are invaluable to travellers.

There are several new and useful software features on the TNC2 (and the FADPAD software for the X-820). Connect and disconnect requests are displayed in monitor mode. No longer any need to go into trace mode to find out who is calling who. Also, digipeated frames are displayed with the complete routing and the station which transmitted the received frame is identified with an asterisk. Again, very useful for determining one's range of digipeating options. If some beacons are too frequent for your taste, place the call of the beaconing station on the 'lid list' and the transmissions from that station will no longer be displayed. Or you can toggle a flag and the lid list becomes the buddy list, providing preferential treatment to the display of frames from your 'buddies.' A calls heard log is implementeed in the monitor function too.

One of the slickest features is the Connect Message. When the function is enabled, another station connecting to the TNC2 will receive a preprogrammed (by you) message of up to 128 characters. Very helpful for implementing a buffer function for unattended operation. Both the connect text and the beacon text are preserved in the battery backed RAM when the TNC is powered down.

Kantronics has provided two Packet Communicators (KPC) for operational evaluation by FADCA. The two persons evaluating them are very pleased so far, and will report in the June BEACON. The KPC seems to be very easy to use on HF, and is fully compatible with other TNCs in all on the air operation.

The SOUTHNET PACKET CONFERENCE will be happening in short order. Preparations are not complete, but that is not a bad thing. Persons are volunteering additional ideas for seminars and activities, and also volunteering to help and lead discussions to the point that I have nearly lost track. The conference or 'packetfest' promises to be a busy, fun-filled two days and I encourage each of you to attend.

Lodging is still available in the UF student union. See last month's BEACON for details, or just call the union at (904) 392-1607. Be sure to mention you are with the Gator Amateur Radio Club. If you prefer to stay in a commercial motel, here are four to choose from: (All 904 area code)

Holiday Inn/University Center - 376-1661
Gainesville Hilton - 377-4000
Days Inn (I-75) - 376-1601
Econo Lodge (I-75) - 378-2346

We are still working on the motor home camping problem. The University policy is not to allow overnight occupancy of vehicles. The nearest 'full-hookup' campgrounds is 22 miles north of the city.

Friday evening there will be an informal meeting/pig-out at Godfather's Pizza Palace, NW 13th St and 23rd Ave. That is approximately 3 miles north of the campus. I'll be there at 7:30 PM, please join me. Talk-in frequency for the packetfest will be 146.91/31 which is the GARC club station. Alternate FM frequencies are 146.82 and 147.375. Naturally there will be packet activity on 145.01! The formal activity will begin Saturday at 9 AM and continue till 5 PM. Saturday evening we will have a dinner meeting, and Sunday, more seminars. Don't miss it!

The SOUTHNET map again appears in this issue. I would like to hear comments on the value of the map and callsign list, and the format we are using. I am very tempted to drop the callsign list because it is so hard to keep up with the explosive packet growth. Perhaps we can convert the map to show possible/favored digipeating routes in the SOUTHNET area. Your comments please.

Out of time and space...C U in Gainesville, or in these pages next month.

FADCA>BEACON

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...And lots of help from many others. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO	Dave Frey, K3AAX
Ted Huf, K4NTA	Dick Klein, W4PCM
Tom Kneisel, K4GPG	Gwyn Reedy, W1BEL
Bill Sams, KF4LG	Bill Whitaker, WD4JKM

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Treasurer - Steve Crowley, N4AIY

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self addressed, stamped (4 ounces) 8 1/2 by 11 inch envelope to the FADCA address.To join, complete the membership application enclosed and send with your dues payment to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple
Half page	$17.00	issue contracts.
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a guaranteed monthly circulation of 250 copies, however that amount is normally doubled by introductory mailings and distribution at hamfests and demonstrations. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed:

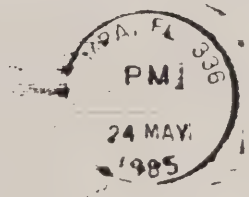
January 1985	- 500	April 1985	- 500
February 1985	- 540	May 1985	- 500
March 1985	-1000		

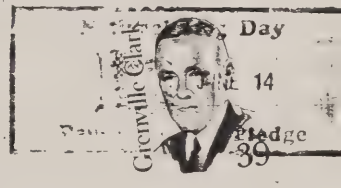
The deadline for inputs for the JUNE issue of the FADCA > BEACON is JUNE 15th (turn in your inputs at the SOUTHNET Packet Conference). Articles should be in final form using a 55 character column width.

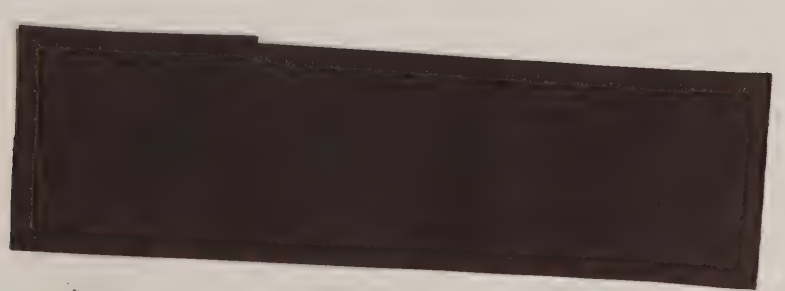
Any material appearing in the FADCA>BEACON may be reprinted without further permission if credit is given to the author and the BEACON.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

FLORIDA AMATEUR DIGITAL COMMUNICATIONS
ASSOCIATION, INCORPORATED (FADCA)
812 Childers Loop, Brandon, FL 33511







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THE SOUTHNET PACKET CONFERENCE
U of FLORIDA, GAINESVILLE
JUNE 15 AND 16, 1985

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 6 Brandon, Florida June 1985

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

The first Southnet Packet Radio Conference is history. It was held at the University of Florida in Gainsville. Many thanks go out to the members of the U of F Gator ARC who co-sponsored the Conference and made all the arrangements for the facilities at the Student Union. Packet people from six states were in attendence.

There were many meetings going on at the same time so I could not get to all that I wanted too.

W0RLI MESSAGE SYSTEM

Eric, N4CI, from Atlanta made a very interesting presentation on the W0RLI Message System. For those who have not used this BBS, it really has some neat features. The one that is outstanding is the automatic message fowarding. Each W0RLI BBS maintains a file of all the users of the other systems that can be linked. The Atlanta system maintains a file of the Adel, Ga. system users, for example. If a message for a station that uses the Adel is entered into the Atlanta system, Atlanta will know this and at a specified time automatically transfer the message down to Adel. This linking of the systems can be on two meters or on HF. The N4CI system in Atlanta is linked to about six other states around the nation on 20 meters and fowards messages to and from them for Atlanta. Another feature of the system is the gateway operation where a user can go in on two meters and go out on HF using the BBS gateway. The W0RLI runs on a Xerox 820 with one 8" or two 5-1/4" drives minimum. You must have a keyboard, CRT and at least one TAPR TNC or clone. If if you plan on doing gateway operation or use another frequency on two meters, you must have a second TNC. If we had a W0RLI BBS system in each LAN operating on some frequency besides 145.01 as the main input and only on 145.01 for forwarding to other systems when channel loading was low, it would do a lot to ease the loading problem that we now have. These systems would not have the gateway into HF but about two or three systems around the state could be deligated t handle the out of state messages on HF. Give this some thought and let me know what you think. I am about 99% sure that I will convert over the the W0RLI system.

9600 Baud Modems

Tom, K4GFG made a very detailed and interesting presentation on the 9600 baud modems and Hamtronics FM-5 220 Mhz transceivers. In the demo that he had set up it was amazing just how fast 9600 buad is compared to our present 1200. Tom pointed out a lot of problems with the Hamtronics FM-5 transceiver. Frequency stability is a big one and the demo setup must have drifted off somewhat because it had a few retries. One of the problems with the FM-5 is a very dirty output, so much so that Tom had to bypass the output transistor and run only three watts. There was lengthy discussion about using the 420-450 band for linking at 9600 baud because there is so much commerical gear available for that band. A number of people pointed out that there is heavy interference from military radar and that it would be hard to get a single frequency coordinated for state wide use on that band. We will be checking with the Florida Repeater Council on this. Tom said that he would continue to try to tame the FM-5.

GATOR 1 LINKING UPDATE

It might look like nothing is being done to get the GATOR 1 Linking Network up and running but this is not the case. The work that Tom is doing on the 9600 baud modems and radios is for GATOR 1 as well as helping Steve Goode on the testing. Howie, N2WX has been tied up on the TNC-2 software but has learned a lot while doing that software that will make life easier when he gets started on the GATOR 1 coding.

Continued >>>

Neil Earnhardt, WA3QFN, describing Xerox 820 modifications

MISSISSIPPI ORGANIZES!

MARDA, Mississippi Amateur Radio Digital Association, is the result of an organizational meeting held on May 30 in Biloxi, Ms. Officers are: President, Patrick J. Fagan-WA5DVV; Vice-Pres., Joe A. Butler-K5OS; Secretary/Treas., Wayne C. Spearman-K4JHE.

The Purposes of MARDA are:

1. To be a truly representative organization for those radio amateurs within the state of Mississippi interested in joining together to participate in and promote the state-of-the-art in digital communications.
2. To provide technical expertise in the promotion and advancement of amateur digital communications technology.
3. To Act as a nucleus in the gathering, study, exchange and dissemination of information and ideas for the benefit of MARDA, its membership amd other interested persons or organizations.
4. To promote and help provide amateur radio digital communications interface between MARDA, its membership, state and local entities, such as the Office of Emergency Preparedness, state and local Civil Defense, Police and Fire Departments, etc. This purpose also extends to health, welfare and volunteer service organizations, such as Red Cross and Salvation Army.

We invite anyone interested in furthering the purposes of MARDA to join us in this exciting phase of amateur radio digital communications. Contact Wayne C. Spearman-K4JHE, 133 Baywood Dr., Biloxi, Ms. 39532.

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FADCA

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION

812 Childers Loop
Brandon, FL 33511
(813) 689-3355

Sponsor of the **SOUTHNET** Packet Network

FADCA is an organization of people interested in digital communications, especially packet radio. We have grown to over 200 members is just over a year, and are continuing to grow rapidly. FADCA's newsletter, the FADCA BEACON is published monthly and provides highly aclaimed technical and operational information. The technical and editorial content is of interest to members located all over the nation, although much of the operational information is related to Florida and the nearby states that participate in SOUTHNET.

You should join FADCA if you are interested in computers, RTTY, AMTOR, packet, emergency communication, traffic handling, satellite operation, or just keeping up with the new digital frontier of amateur radio. Please complete the application below and send with your dues to the above address. If you would like a sample copy of the FADCA BEACON, send a SASE (39¢) to the FADCA address.

FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

NAME:_____ CALLSIGN:_____

STREET
ADDRESS:_____

CITY:_____ STATE:_____ ZIP:_____

HOME
TELEPHONE: (_____) _____ - _____

WORK
TELEPHONE: (_____) _____ - _____

ARE YOU NOW OPERATING: PACKET? AMTOR: RTTY: OTHER SPECIALIZED MODES?

WHAT EQUIPMENT ARE YOU USING: _____

WHAT ARE YOUR INTERESTS IN DIGITAL COMMUNICATION? _____

_____

A NON-PROFIT ORGANIZATION FOR RESEARCH, DEVELOPMENT, EDUCATION, AND PUBLIC SERVICE.

DIGIPEATER MEETING

The main topic at the digipeater meeting was the proposal to change the wide area digipeater calls to the city name. This may sound far out at first but it would work like this. The Stuart digipeater, K4NTA-1, would change to STU. N2WX-7 would be MLB. WA4ARE-1 changes to WPB and so forth. A connect request to WA4HXZ in West Palm Beach from a station in Melbourne would look like this: CON WA4HXZ VIA MLB,STU,WPB. It would make it a lot easier to remember how to get packets routed and if a digipeater shut down and a new one came up to serve a LAN, the LAN name would not change and users would not have to worry about a new call to remember. The city names would be limited to three letters and be the airport desingator or city abbrevation, which ever sounds and looks better. It was pointed out that these digipeaters would still have to indentify with their ham call plus /R. It was felt that this could be done by sending an ID frame (beacon) every 10 minutes with the text reading something like "de STU K4NTA/R Digipeater Stuart". For those digipeaters that for some reason cannot send out an ID frame or beacon the owner or control operator could send the ID frame from his station and have it digipeated by the digipeater for which he is identifing. We would like to have your comments on this. If there is not a great outcry saying not to do it, we will.

NETWORKING

Jack Brindle, WA4FIB

One of the most misunderstood aspects of our hobby is the methodology of transferring data between two packet stations. Almost every "expert" involved with packeting has a different idea of how things should be done in this area. In order to bring some understanding to the design and use of the AX.25 "protocol", we will be presenting a series of articles that will try to explain the considerations which form the basis for a protocol.

[Ed. note: By profession, Jack is a computer networking engineer for a major networking company in the Clearwater, Fla. area. The company's product line includes networks for large computers that transfer data using the X.25 protocol. His academic work includes BS degrees in both electrical engineering and computing science. The point here is not to impress the reader, but to show that Jack does have the background for these discussions.]

The main purpose in computer networking is to transfer computer type data from one system to another. The systems may be large mainframes, microcomputers, or plain dumb terminals. Each device has a common problem, though, it needs information that is stored someplace else.

Many years ago computer engineers realized this problem, and set out to find a good logical solution. As more computers were introduced with varying architectures the problem got worse. Each computer had its own way of storing data and transferring it. To help solve the problem, representatives from the various computer companies met to provide a common transfer format. This soon evolved into an international effort under the auspices of a group called ISO, the International Standards Organization. This group defined a model for the design of systems to transfer data between differing data products. The problem was divided into seven logical areas, each of which performed an important task to see that data was correctly transmitted and received, and then translated to a form needed on each system. The model also provided for an interface into the end system so that the communications could be handled easily inside the computer or terminal. The group named this model the Open Systems Interconnect (OSI) because of the nature of the tasks it defines.

The seven groups, or layers, of the model are related in that they each perform some task on data they receive from a neighboring layer, then pass the modified data onto another neighboring layer. Data fed in at the top layer in one computer will appear at the top layer in another computer in a form directly useable by the second system. Names were given to each layer describing their function. The seven layers are:

7- Application, which provides an interface to the computer's operating system.

6- Presentation, responsible for translating data into a form useable by each computer or terminal.

5- Session, where the destination within the computer is determined.

The next four layers, known as the "transport service," do the work of transferring error-free data between the two connected systems. The transport service is used in networks that contain several stations to relay data between two "end systems."

4- The Transport layer resides only in the end systems, and provides error detection and correction for data flowing between the two end systems.

3- The Network layer defines the route the data will take as it is relayed from node to node, and the

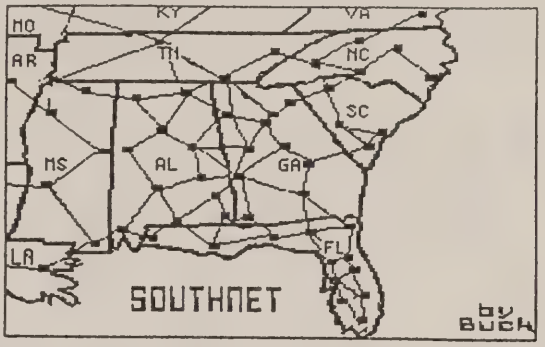
2- Data Link layer transfers the data between two consecutive stations, or nodes, in the network.

1- The Physical layer actually carries the individual data bits between each node in the system.

Future articles will discuss each layer in detail to show the tasks each performs and how they do it.

DIGITAL IMAGE TRANSFER
Buck Rogers, K4ABT

The procedure(s) and equipment wsed in the transfer of Hi-rez pictures, documents and/or files will vary by station and in accordance with the operators preference.



The potocol defined herre is a system tried and proven by myself and N4AGO, George, in Seale,Al. We call this process "DIGITAL IMAGE TRANSFER" or "DIT".

1. Digitize video tape or live picture using the DS-69 digitizer ($149.00 from Micro-works) and save to disc.

2. The picture is then picked up from disk using Graphicom II*. (any touch-up or color changing is done at this point) The picture is then saved in standard Graphicom* format.

3. A program called GC>BIN** is now used to quickly take the picture to disk in binary code, as soon as this is done another program BIN>ASC** is used to compress the picture into ASCII for DIT via packet.

4. At present I load ASCII picture to buffer, connect to target station, then we set parameters to MC off, AW 8, PAR 4, TXD 6, AXD 2 and in transprarent or conv.

We have had great success with this procedure, however, experiment, this is what packet is all about. For more information contact:

Buck Rogers, K4ABT
1323 Autumnleaf Ct.
Columbus, Ga. 31904
(404)322-3250

(Buck runs his DIT on a TRS-80 Color computer with CGP-220 color jet ink printer and the Heath HD-4040 tnc. ed.)

* Graphicom and Graphicom II are (c) and are available from Computize; Langhorne, Pa. 19047 ($24.95)

** are supplied as part of Graphicom package.

Volume one (1984) back issues of the FADCA>BEACON are available for reproduction and mailing costs of $.75 per issue, or $5.00 for the entire year (11 issues). Send your request to the FADCA address.

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PACKET MADE EASY

By N4ZQ and KB4LLO

Kantronics, long noted for their popular RTTY, ASCII and AMTOR software - hardware, has emerged onto the packet scene. First rumored in the March BEACON from conversations with Travis Brann, at the Orlando Hamcation, and offically unveiled at the Dayton show, the Kantronics Packet Communicator (KPC) offers another way to join in on aIl the fun of packet radio.

During the Orlando hamfest, FADCA arranged to receive and review two KPC units. One has been in operation daily on both 2 and 20 meters from the N4ZQ QTH near Tampa, and the other some 45 miles away at the KB4LLO shack in Bradenton. Yes I did say 20 meters, and more on that later. First impressions are not always the most accurate. The evening I was handed the secure shipping package from Lawrence, Kansas, my reaction was one of doubt. Before opening the small, thin box I questioned if the TNC was in there. Believed that they had only sent the manual. Surprised would best describe my feelings upon finding not only the manual, but the TNC, power pack (an unusual inclusion for Kantronics) and a bag of cables and connectors. Housed in an attractive cream color case with a two tone blue front panel, the TNC measures only 6 x 8 x 1 3/4 inches. A quick glance through the 41 page manual, found the entire schematic diagram on one page with print large enough not to cause eye strain. Hardly could wait to get home with it and put it through its paces. Believed that there weren't enough parts in it to operate.

Once back in the shack we proceeded to read the manual in order to see what was needed for interfacing. One personal observation that we have made over the years, is that Hams don't like to read the manual. And the quickest way to discourage them is to include a big, heavy 2 inch thick book. The Communicator manual is well written, easy to understand and won't weigh you down carrying it. After a short introduction and brief description of amateur packet radio, installation instructions were found on the third page. All cable connections (audio in, rig, computer and power) are attached to the rear panel of the TNC where the power switch is located. Operating power is supplied from a plug in wall transformer. Care must be exercised, as the transformer has a switch selectable multiple voltage output and polarity switch. Although you can not select more than 12 volts out, you must make certain it's set for positive output. Also steps should be taken to make sure it remains set correctly and is not accidentally changed. Radio interfacing is accomplished by means of 3 jacks. A pair of mini jacks for audio in and out, and a 5 pin DIN connector for PTT, transmit audio and ground. The DIN connector and 3 feet of shielded cable are factory constructed. All you need to supply is a suitable mike plug for your transceiver. Computer or terminal connection is via a standard DB-25 connector. One plus of the KPC is that it is RS 232 or TTL compatible. Changing the computer voltage levels is accomplished by moving simple jumper on the PC board. This feature should be welcomed by all Commodore users, as the expensive TTL to RS232 intrerface is not necessary. N4ZQ already had the VIC 1011A interface in use with his TNC-1, so we chose the factory preset RS 232 level for testing. Hookup was very simple and straightforward, with excellent details in the manual.

The heart of the system is a 6803 CPU, running under control of a pair of 2764 EPROMS. Also included is 8K of RAM and a NOVRAM for holding changeable operating paramenters. A departure from other TNCs, and unique only to the KPC, is the AM7910 modem on a single 28 pin chip. No external filters or tuned circuits are required. Using only a crystal and a few noncritical components, all the features a modem should have are built right in. For more information on the 7910 see the 1985 ARRL handbook. The modem chip interfaces with the 6803 via an I/O port, which is shared with the NOVRAM and RS232 from the computer. The use of the 7910 gives the TNC one of its greatest features. That is the ability to software select between BELL 103 or 202 tones. BELL 202 tones are 1200 BPS, 1000Hz shift, used by all TNCs on VHF. Bell 103 are 300 BPS, 200 Hz FSK tones, found on 20 meters and other HF bands. Measured center frequency for the tones are 1700 Hz and 2125 for 202 and 103 tones respectively. The 2125 Hz center frequency is 400 Hz higher then most other 300 BPS TNCs on the air, but causes no problem when tuning in the lower sideband mode if one is aware of it.

The KPC is compatible with existing packet TNCs, and supports both AX.25 anad Vancouver Protocols. At first glance at the command list, you would be hard pressed to see much difference between the KPC and the TAPR. In fact, the bulk of the software is Tucson based. The KPC supports 61 commands, of which 90% are the same as you would find on the TNC-1,AEA or Heathkit. But closer inspection reveals some interesting commands, such a BELL for changing the modem configuration. Another is the EQUALIZE command which is used to combat high frequency roll off from some transceivers. This command is only operational in the 202 tone mode, and requires experimenting to see if you need it or not.

The CALIBRATE command is an interesting one, and not what you would expect. Having the modem self-contained, there are no alignment adjustments that have to be performed. The CAL command is used to tune the transceiver for operation with the TNC. You are able to transmit a square wave mark/space tone at HBAUD BELL setting that the distant station then can tune to, using the receive option. Pressing the R key for receive measures the square wave at the EQUALIZE/BELL setting. The reading is displayed on the screen in the form of two numbers. The object is to get the two numbers to read as equal as possible. This function is a tremendous help when working single sideband 1200 baud packet. A tuning indicator of any type is a must with any SSB packet operation, and this is one of the best we have seen yet. The two KPC reviewers live just far enough apart to make simplex copy marginal at times. A late night experiment on 2 meter SSB at 1200 BPS, using the on-screen frequency counter was very sucessful. Signal level at times was just above the noise, but after both parties completed a receive calibration, a Connect was established first shot out of the barrel. If you have never tried to tune in the short burst of a 1200 SSB Packet, you're in for a real treat. We hope to try this tuning aid through the satellite, where signals are very touchy. Will report the results at a later date.

ABAUD or the rate for the I/O serial port, is set for 300, 1200 or 9600 BPS. In fact, you can not perm the rate into NOVRAM. Apon power up of the TNC, it goes into a auto baud routine everytime, supporting one of these rates. HBAUD selects the data rate for radio transmission. The KPC offers 4 choices, 300, 400, 600 or 1200 BPS. Although the command lists a FULLDUP for Full Duplex, the manual makes no mention of it and the TNC does not support it.

TAPR commands not found on the KPC are TRACE, DEBUG, IDTEXT and CWID. The lack of CWID is to be commended, from one that believes they only bog down the throughput on the frequency.

Probably one of the most difficult areas of any packet operation is the correct implemention of Flow Control. Kantronics has improved apon it greatly. The KPC will send the terminal an XOFF when there is room remaining for ten characters in the transmit buffer. If data continues to be sent, the TNC will send a XOFF after every character is recieved when there is room for only five more. The TAPR TNC-1 kit board sends only the one XOFF signal and my software program never seems to pick up on it, and I always over run the buffer.

Transmit audio is factory preset at 21 mv, which turned out to be just right level for the radios used for this review. However, because different transceivers require different AFSK tone levels, a jumper located on the TNC PC board can be adjusted to modify the level. If necessary, changing a common resistor can cause additional modification.

Operation of the KPC was very enjoyable. From the easy hookup, to the fun of 20 meter DX Packet, there's a lot to be said for the Communicator. FADCA wishes to thank Kantronics for the loan of the KPC for this review and demonstration at the SOUTHNET Packet Conference. Probably they said it best in their advertisement, in that they "made getting on Packet as easy as getting on RTTY".

Suggested Retail Price $389.95
Kantronics
1202 E. 23rd Street
Lawrence, Kansas 66046

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
(305) 723-8659

NEWS AND VIEWS

Gwyn Reedy, W1BEL

The SOUTHNET Packet Conference really happened. Not that there was any doubt the meetingplace was reserved, or anything like that, but there can be meetings that have no life to them. This meeting was not a dull, slowly dying tradition , but a rip-roaring new one, a happening! Over one hundred people from six states made the trip to UF at Gainesville and the excitement and enthusiasm was overwhelming. Yours truly learned the hard way about some of the hazards of putting together a program, but the only complaints heard were those of persons not able to take in all of the interesting activities. There was a great sense of regional pride in this first SOUTHNET gathering.

I wish to personally (and for FADCA) thank all the persons that attended the conference, and those that helped it to happen. The bulk of the work was done by the members of the Gator Amateur Radio Club of UF, especially Scott Fox, KF4TT, and Joe Dipietro, WA4NWO. They took care of the arrangements excellently and were constantly willing to help with last minute changes and improvements. Thanks also to each of the speakers and seminar leaders, many of whom hauled personal equipment of considerable bulk and value to help make the conference interesting. Also a special thank you to Pete Eaton for travelling from Illinois to represent TAPR and give his famous 'Packet Primer.' (If you count Pete, 7 states were represented at the packetfest.) The only sad note of the weekend was the news that Jim Diggs, K4AHO, was hospitalized with heart problems. He is now home and recovering well. He thanks the packetfest attendees for the flowers.

The next SOUTHNET gathering will be hosted by GRAPES. It will be held in the Atlanta area in the Nov-Dec time frame. Subsequent meetings will be held at various populous sites throughout the SOUTHNET area.

SOUTHNET COORDINATING COMMITTEE

I was unable to attend as many of the seminars as I wanted due to required organizing duties. The most significant one for me was the Sunday session about SOUTHNET. A packed conference room discussed the formation of a SOUTHNET-wide committee to bring uniformity and consistency to SOUTHNET operations. The following points were agreed upon:

1. The body will be called the SOUTHNET Coordinating Committee (SCC).
2. The states of Alabama, Florida, Georgia, and Mississippi are definately participating in SCC.
3. The states of North and South Carolina, Tennessee, and Louisiana will be invited to be members. Close coordination will be maintained with states bordering SOUTHNET regardless of SCC affiliation.
4. Each state in SCC will be represented by two persons.
5. The purposes of SCC are:
   A. Information exchange and coordination.
   B. Uniform representation to state frequency coordinating bodies and other networks.
   C. Promotion of standard protocols and operating practices.
   D. Public relations with existing organizations (including the National Traffic System).
6. Current issues:
   A. BBS/mailbox frequency architecture and operating protocols.
   B. Network routing and addressing methodologies.
   C. Definition of the SOUTHNET linking structure.

Initial SCC members are :

Alabama- Henry Wingate, K4HAL and Frank Evans, W4HFU.
Florida- Keith O'Brien, N4ZQ and Gwyn Reedy, W1BEL (replacing Scott Fox, KF4TT).
Georgia- Dennis Barrow, WB4GQX and Wayne Harrell, WD4LYV.
Mississippi- Joe Butler, K5OS and Pat Fagan, WA5DVV.

PACKET AS A TOOL

The value of the packet network as an information utility has been mentioned frequently in this column. The concept has become more real for me since the Packetfest.

When the TAPR Beta boards arrived in March 1983, they were an exciting curiousity. Getting them interfaced to the radio and computer was a major task. My VHF equipment and knowledge of propagation was weak. Much of the time was spent tuning the RF gear and attempting to communicate over distances of a few miles. For the next two years, my computer room and ham shack were the same room, and operating packet was done there. I always had the terminal where I could see the S-meter and hear the incoming packet sounds. Also the ever present clicking relays in the amplifier. Even when working the 130 mile path to K4NTA became almost routine, it was still a 'radio' activity.

Upon returning from the Packetfest with my 'Emerald Xerox 820' I set it up in the study and ran a cable to the ham shack for connection to the TNC. Also installed the phone modem and a second terminal there. Now I can operate packet and word process, or packet and get on electronic telephone nets at the same time. The amazing thing to me is that packet now seems more like an information/computer activity. I enjoy the RF gear in the ham shack and haven't forgotten it, but packet now seems less like 'operating.' The use of the telephone connection or the packet seem very similar now. The new location is very convenient, but I miss the atmosphere of the shack. I wonder how other people perceive packet.

THE JUNKBOX

FADCA still has about 65 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual channel HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover. The SCCs are now in stock for shipment. (TAPR now has additional FADboards in stock).

FADCA has another shipment of Beehive B-152 terminals. These terminals are guaranteed to work when you get them (but keeping them working is your problem, HI). RS-232 port and auxiliary port, 80 x 24 display, many function keys, etc. Terminals receive upper and lower case, but may only transmit upper case unless modified. Documentation is available. $75.00. Call or write FADCA at published address.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

KLM-2M-22C Still in factory box for $110. This is the new KLM OSCAR downlink antenna. Dick Jansson, 1130 Willowbrook Trail, Maitland, FL 32751. (305) 644-9008.

Retired amateur now living in an apartment selling: Kenwood TS930S with tuner, Kenwood TL922A amplifier, HAL CT2100 KB2100 with Sanyo 12" monitor, Drake MN2000. Sell all or part. Donald Brown, 226 Red Cedar Pl., Brandon, FL 33511. (813) 685-6688 evenings.

FADCA has a modem kit which provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. It was fully described in the March BEACON. The price is $8.95 which includes shipping and handling charges. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
2677 Hereford Rd.
Melbourne, FL 32935

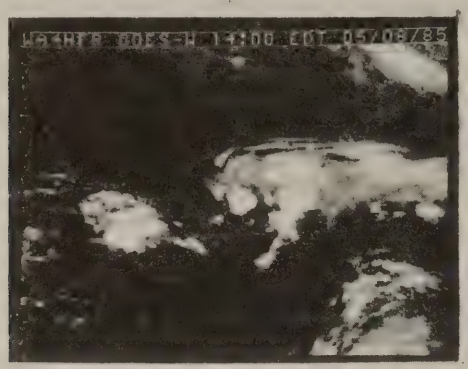
The original run of 100 boards is gone. We have ordered another 100. They should be shipping by the time you read this.

FADCA NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday at 8 AM. NCS: K4NTA
BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday at 7:30 PM. NCS: KF4EF
BREVARD COUNTY AREA: 147.060 (+600) Sunday at 8 PM NCS: N2WX
BROWARD COUNTY AREA: 145.270 (-600) Sunday at 8 PM. NCS: K4GFG
CRESTVIEW (Panhandle): 147.360 (+600) Sunday at 8:30 PM (after traffic net). NCS: K3NN
GAINESVILLE: 146.91 (-600) Monday at 8PM.
STUART: 147.060 (-600) Sunday at 8 PM.
WEST PALM BEACH CO: 147.285 (+600) Monday at 8 PM.

AMATEUR TELEVISION (ATV) WEATHER SYSTEM
MICHAEL P. BAKER, WA4HFR

The Amateur Radio Community of Gainesville now has a very unique service available....an ATV (Amateur TeleVision) smorgasboard of weather imagery and information is bieng transmitted in the Amateur 70cm. band at 426.25 MHz. Everything you could ever want to know about local, area, and regional weather can be accessed thru the Gainesville 22/82 repeater and viewed right in your ham shack on your home TV! Primary control is via phone line and UHF radio link.



The list of imagery available includes:

1) Cloud cover of United States Southeast Quad rant, including the Gulf and Caribbean areas.
2) Close up view of cloud cover over Florida.
3) Composite radar rainfall image of Florida.
4) Cumulative rainfall image (24 hour) of Florida.
5) Text printout of area and state weather related information which scrolls across the screen.
6) WEATHER ALERTS or other EMERGENCY MESSAGES to be disseminated to local Amateurs.
7) Close up views of cloud cover over virtually any area in the Western Hemisphere.
8) Animation of cloud or storm movement.
9) Lotsa other nifty stuff!

All a local ham needs to view the ATV weather imagery is a beam antenna just above the tree-top level, and a down-converter. The down-converter shifts the 426MHz. ATV imagery down to channel 2 (56 MHz) so it can be tuned in on your home TV set.

The transmitted image is studio quality and very high resolution. If you are within a few miles of the transmitter, perfect, noise-free pictures are easy to achieve with only a samll antenna at tree-top level. Some hams have reported very acceptable pictures and only a little noise, with the converter sitting on top of the TV and using only a clip-lead for an antenna! This, of course is the exception, but it shows that within the 1 to 4 mile range, it doesn't take anything fancy to have excellent pictures.

In the 5 to 10 mile range, however, picture quality becomes increasingly dependent upon antenna height and gain, and the nature of any obstructions blocking your antenna's "view" of the transmitter site. Unfortunately, trees (foliage) absorb a great deal of the 426 MHz signal you are trying to receive. A few minutes study of a topographical map will reveal the good (or not so good) news about what you will need to do to assure good reception. Beyond 10 to 15 miles, out to a maximum of about 30-35 miles, tall towers and big beams are mandatory.

THE GOES WEATHER SATELLITE

The cloud cover imagery is downlinked from the GOES EAST Meteorological Satellite at 1687.1 MHz. The imagery is not a TV signal at all, but rather originates as a kind of digital telemetry "slow-scan" and must first be converted to a picture format by computer, then converted to a standard TV image. GOES is a geosynchronous bird normally located at 75 deg rees WEST. Infrared and visual "photosensors" on board focus to a spot on the earth's surface as small as 900 yards square. The satellite is spin stabilized at 100 RPM, and each fixed imaging sensor sweeps a single narrow path across the earth's surface as the satellite rotates.

A stepping mirror begins the image sequence at the North Pole. On each successive west to east satellite revolution, the mirror increments and the image path is a tiny bit southward. A complete earth image scan (pole to pole) takes 18 minutes, and produces a visual and infrared image consisting of 14,568 visual scan lines. Each scan line contains 17,472 digital words, and each word represents a pixel (picture element). Each pixel word contains 9 bits, allowing 256 grey scale levels. A full earth view requires almost 70 megabytes of computer disc memory to store and rpocess. A complete new image is transmitted every 30 minutes, on the hour and on the half-hour.

THE DOWNLINK AND COMPUTER SYSTEM

The GOES downlink is located on the campus of the University of Florida. Visual telemetry is at 1687.1 MHz, and is received with a 7 meter dish and 40dB./70deg. LNA. The NRZ PSK telemetry is downconverted to 67.1 MHz. and processed by a PSk demodulator. The demodulated PSk is then processed by a pair of bit-stream synchronizers. One extracts and processes the .5 megabaud data rate INFRARED telemetry and the other extracts and processes the VISUAL 2.1 megabaud data rate telemetry.

At this point the infrared and visual telemetry are routed to a "super-black-box", known as a Telemetry Frame-Synchronizer/Sectorizer. This sectorizer hardware is used to split off small sectors of the imagery, process it "on the fly" and format the telemetry into 16 bit parallel words which are fed to a Hewlett-Packard HP/1000 E-series Computer. The computer stores the sectorized images on disc, and is capable of many kinds of enhancements. A video display system allows viewing the imagery on a special RGB Color monitor.

THE ATV SYSTEM

Unfortunately, the imagery from the computer image display system is not compatible with an ordinary TV set or monitor, so some way to create a standard TV image had to be built. Thus, the ATV system begins with a home-built D/A Converter and Video Formatter. This circuitry takes 8-bit BCD TTL pixel information and clocking signals from the computer and converts them to an analog signal. This analog signal is the combined with video sync and control pulses obtained from a video sync pulse generator. The resulting composite video signal is quite high resolution; 768H X 512V X 16 levels.

The video is fed to a (PC Electronics) modulator and transmitter module, and then to the antenna on top of the building. The frequency is 426.25MHz and the transmitted bandwidth is somewhat higher than a standard TV signal. No audio subcarrier is carried with the video, but if audio is found to be necessary in the future, it will probably be carried on Two Meters. At the present time, most transmissions are black and white, but color transmission of all of the imagery is planned. A video NTSC encoder is on hand to produce color TV imagery, but needs a lot of work and modification toallow it to work with the present equipment line-up. Some of the images are best displayed in black and white (cloud cover) and some are best displayed in color (radar composite images). Several pieces of the gear are capable of producing color imagery, but there is much work to be done yet before color can be transmitted on a full time basis.

Other equipment in the ATV lineup includes; 1) A TV camera with a lighted stage for showing ID's, title cards, or other printed graphics or photos. 2) A flying spot scanner (color) with an integral Kodak rotary slide tray for showing color slides. 3) A digital clock and circuitry to insert (key) time over the outgoing video. 4) A video processor to allow color title inserts and special effects such as split screens, color backgrounds, etc.

Local amateur radio users will be able to call up particular images they are interested in, by accessing a local two meter repeater and giving a series of two-tone control commands. Primary control is by phone line and a UHF radio link. The control comands are decoded at the ATV site, initiating the series of imagery desired. A time-out period automaticalluy terminates the sequence. Emergency messages or weather alert bulletins generated by the computer can be sequenced automatically, and will repeat periodically. Animated time-lapse sequences of cloud or storm movements are also available. A 6-hour sequence of the images received every half-hour (or a 12 hour sequence of horly images) is stored in memory. When the 12

Continued >>>

Continued from previous page.

image memory "stack" is full, each new image placed in the "stack" will displace the oldest. Upon command, the images will re-cycle repeatedly, pausing momentarily each time on the current image.

The existing ATV installation uses only a 10 watt transmitter and a small antenna at a height of about 60 feet. Future plans are to: 1) relay the signal to a repeater with a 10 db gain omnidirectional antenna located much higher, 2) boost the power and use a 10 db gain omni-directional antenna placed somewhat higher at the present location. Available finances will decide which plan will be implimented.

Permission has been granted by the Regional FCC Field Office and the Military Area Frequency Coordinator to run much higher power and operate as a repeater. When the system is in operation as a repeater, high power mode will be used. When repeater operation ceases, the meteorology imagery will be carried on the low power beacon carrier.

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3631 N.W. 41st. lane (res) 904-378-3478
Gainesville, Fl. 32605

CONNECT - The Beginners' Column

Don Deem, KB4LLO

As everyone involved in any hobby or pastime utilizing electronic equipment knows, from time to time failures occur. And when these failures manifest themselves, we must decide if we wish to return the device to the manufacturer or the manufacturer's representative to have the device repaired, or should we seek the assistance of the ham down the street, the one with the garage full of assorted electronic equipment. Or should we take the big step and try to fix the unit ourselves? It is to this electronic enthusiast, the do-it-yourself individual, that we address this month's column. The focus of this article will be the TAPR TNC-1, which includes the AEA unit, as well as the Heath HD-4040.

The purpose of this article is not to create legions of consumate tnc technicians, but to provide you with some basic techniques and guidelines to permit the interested ham to troubleshoot this extremely complicated electronic device.

The equipment required depends on the depth to which you decide to dig into this board. I would suggest a good digital voltmeter, an oscilloscope, and of course the necessary handtools to do electronic work.

The first method outlined requires no test equipment, but does require extreme care. This method we will refer to as the direct replacement method. It's really quite simple, you go to a friend's house (one that has a TNC like yours) and exchange chips, one at a time testing each time. When your board begins to function you can assume that the last chip that you changed was probably the culprit. You may verify this by putting the suspected chip into a working board and looking for similar results to what you experienced with your board. I want to stress the following statement as strongly as is possible, DO NOT REMOVE OR INSTALL INTEGRATED CIRCUITS WITH THE POWER APPLIED TO YOUR TNC! Believe me when I say, the results could be disasterous.

The next method is the long method. You begin with a visual inspection of the board, looking for anything out of the ordinary like burned or discolored resistors, broken components or foil patterns, and solder bridges. Close attention should be paid to the solder side of the board. If a joint appears dark in color, or dull in appearance, a faulty joint may be indicated. Next check all the integrated circuits to be sure that they are properly seated in their sockets. Be sure that all connectors are properly seated. Once you have completed your visual inspection and you are satisfied that everything is right, you are ready to apply power.

A word of caution. Since the transformer contacts are exposed, extreme care must be taken while working in this area to prevent serious electrical shock. Apply power to your TNC and take readings of the power supply voltages. Check these readings against those taken when you constructed your tnc. The readings taken then and those just recorded should compare favorably. If not, focus your attention on the power supply area.

I recommend that you turn to the troubleshooting chapter of your TNC manual and follow the instructions there. You can localize the problem by determining if some of the board functions still work. For instance, will the board digipeat other station's packets? Will it communicate properly with your terminal? Does it appear to do everything correctly but you cannot connect to anyone? Do you display any monitored packets?

If you find that you are unable to solve your problem, there are several FADCA members here in Florida who are skilled in TNC repair.

In future articles we will feature tips from these talented repairmen to aid you in maintaining your own board. You troubleshooters, send me your tips, or an article, and become a guest writer for this column in a future Beacon.

I'm sure everyone has heard about the Southnet Packet Conference by now, so I won't repeat the descriptions of the seminars and meetings. I would like to tell you about some of the great people who worked so very hard to see that this conference would be successful. Pete Eaton was there both days, giving all he had to insure our success. Thanks Pete! How successful would our conference have been without Scott, Joe, and members of the Gator Amateur Radio Club of Gainesville? They saw to it that everything ran very smoothly and that we had everything we needed. And thanks to Gwyn for conceiving the idea and making it all happen. I personally hope that the Gainesville Convention becomes an annual affair. To these people and the many others who I can't name because of space limitations, I want to say "I salute you".

I read the other day in one of our well known amateur publications that our Amateur Radio hobby was dying. The person who wrote that article obviously had not attended a packet meeting, and probably doesn't know any packet enthusiast, or he wouldn't have made such a broad statement. I only wish he could have been in Gainesville to observe the exciting, dynamic people in attendance. If he had been there his message would have been that our hobby is alive and well, and soon may be better than ever!

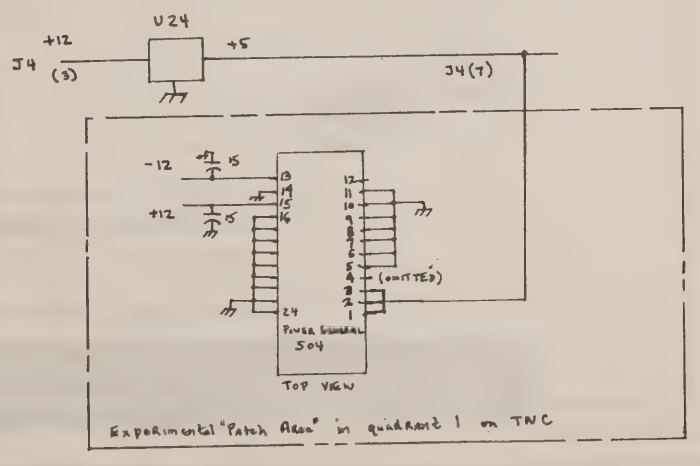
TAPR TNC MODIFICATION FOR 12 V USE

Robert Ball, WB8WGA

I have modified my TAPR TNC for 12-v protable operation by installing a Power-General dc to dc converter chip to generate the + or - 12v source for the EIA and analog circuitry. The circuit, as shown on the data sheet, can be referenced below.

I removed U22 and U23 from the board since they are no longer needed. Note the power dissipation in U24 increases about 4 watts, but the supplied heatsink is adequate if mounted properly on the chassis. The board will still operate properly from 12 volts. If you desire to leave the 12v source connected while operating from the ac supply, a diode should be provided in the +12v lead connection to J4. The TNC draws about 1 amp form a 13.5v power source.

(This article was reprinted from QEX, June 1985)



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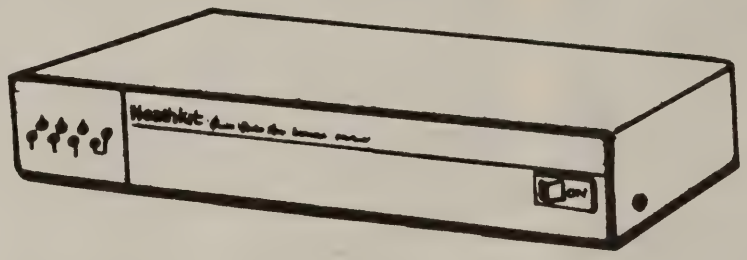

*** CONNECT

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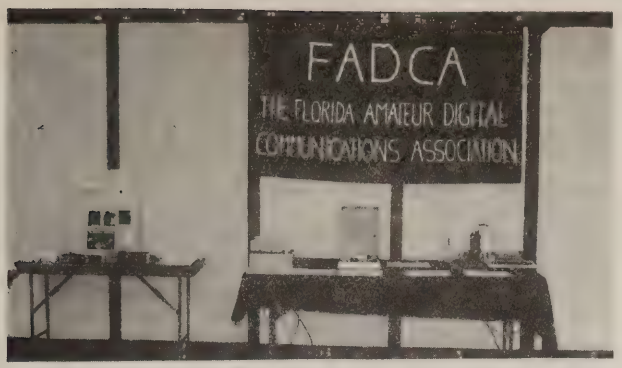
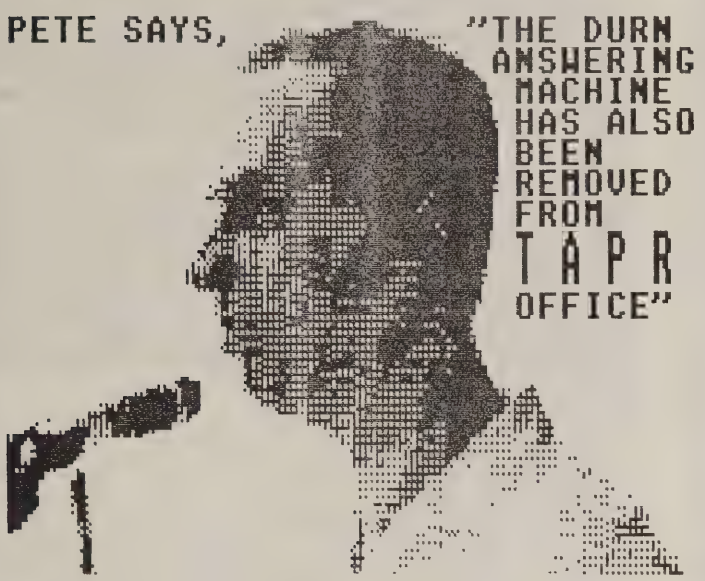
SOUTHNET PACKET CONFERENCE SCENES

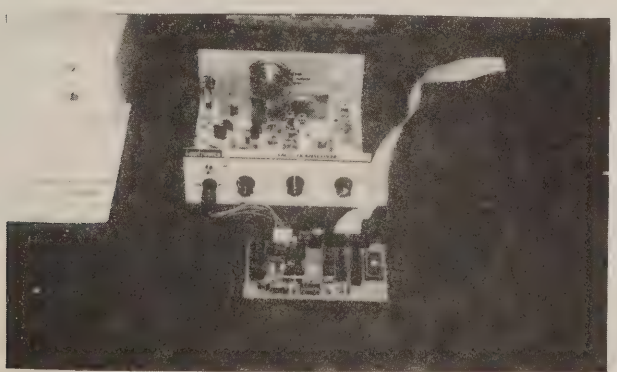


The FADCA and TAPR TNC2 display



DIGITIZED IMAGE OF PETE EATON

The Georgia Radio Amateur Packet Enthusiasts Society display



The prototype K9NG 9600 baud modem, TNC and radio gear

Welcome
to the

SOUTHNET
Packet Conference

University of Florida, Gainesville

June 15th and 16th, 1985

hosted by

Gator Amateur Radio Club

Sponsored by

Florida Amateur Digital
Communications Association, Inc.

SATURDAY

TIME	AUDITORIUM	RM 349	RM 361
9 AM	WELCOME AND INTRODUCTION BY GARC, FADCA, GRAPES, SAPS, TAPR	.....	.....
10 AM	PETE'S PACKET PRIMER	COMMODORE 64 SEMINAR	9600 BAUD LINKING PRESENTATION
11 AM	DIGITIZED IMAGERY PRESENTATION	MACPACKET & GABBI PRESENTATION	APPLE USERS GROUP
12 PM	.....	TAPR TNC2 DISCUSSION	OSCAR PACKET USERS SEMINAR
1 PM	NETWORKING PROTOCOLS	KANTRONICS & GLB TNC DISCUSSION	.....
2 PM	.....	W0RLI MAILBOX AND HF PACKET OPERATION	CP/M COMPUTERS AND PACKET
3 PM	EMERGENCY COMMUNICATIONS	XEROX 820 ADAPTATION FOR PACKET USAGE	SYSTEK ELECTRONIC INFO EXCHG (SEIE)
4 PM	TRAFFIC HANDLING VIA PACKET	XEROX 820 AS A CP/M COMPUTER	SOUTHNET BBS OPERATORS MEETING
6 PM	DINNER AT FRONTIER CATTLE COMPANY		

NOTE: ROOMS 334, 337, 346, 347, 355, 356, 357 ARE AVAILABLE FOR STATIC DISPLAYS AND INFORMAL DISCUSSIONS ALL DAY SATURDAY AND SUNDAY. ROOM 365 IS THE WORKSHOP AND TEST EQUIPMENT ROOM.

SUNDAY

TIME	AUDITORIUM	RM 346	RM 361
8 AM	.....	FADCA DIRECTORS MEETING	TAPR TNC 2 (REPEAT)
9 AM	.....	DIGIPEATER OPERATORS MEETING	XEROX 820 (REPEAT)
10 AM	GATOR-1 SEMINAR	GARC RADIO CLUB STATION TOUR	
11 AM	SOUTHNET COORDINATING COMMITTEE MEETING	TOUR CONT.	
12 PM	SCC CONT.		
1 PM			
2 PM			
3 PM	OFFICIAL CLOSING AND CLEANUP TIME		

NOTE: Sunday's schedule has been left open to accmmodate write-in events repeated from Saturday or other unscheduled events. Sunday is planned to be a day in the workshop. All rooms listed on Saturday's schedule are available for use.

Photos by KB4LLO

HF OPERATION WITH THE TAPR / HEATH / AEA TNCs

John Dewey KA9CAR
4904 Drive In Lane
Crystal Lake, Il 60014

I like to operate HF packet on the weekends; but I still want to have access to the local VHF network during the week and Sunday evenings. Retuning the modem is an easy but time consuming task. This modification lets you change from the wide VHF to the narrow HF tone sets with the flip of a switch.

If you compare the values of the components for the HF and VHF headers, there are only two differences. These are R46 which determines the demodulator bandwidth and C21 which is part of the post-detection (low pass) data filter. The values of R36 and R38 set the transmit tones. The receive center frequency is the same for both HF and VHF.

With the addition of a few components you can quickly switch from the VHF tone pair to the HF tone pair. The schematic shows how. All connections to the modem, except the grounds, were made on the headers (U34 and U35). TAPR designed the TNC with only one ground connection between the audio and digital circuits. Don't mess that up by using the wire wrap area ground for the modification!

I purchased the 3PDT switch and 2 multi-turn resistors at Radio Shack. Mount the resistors by bending the "rear" leads and using a drop of instant glue on the pots so that they are standing up with one soldered onto the ground connector for R59 and the other at the plated through hole near C15. Drops of colored nail polish can be used to pair R36 with R36A and R38 with R38A. Cut the "top" leads off the resistors and solder hook up wire to the "center"pins. R35, and R37 are lifted from the headers at one end only and wired to the switch. R46 is removed and mounted on the switch with R46A. Unless you have a 4 pole switch, leave the post-detection data filter (C21) at the value for 1200 baud.

Tune up follows the normal routine with the entries of 1/1152 and 2/1024 being used when the switch is in the "A" position. While you are at it recheck the standard tones. A tuning indicator such as the one in PSR #11 is a great help when trying to tune in packets on HF. I found that connecting the "spare" LED to go out when the regular DCD is on provided a very useful "bar DCD" which is adequate for casual packet tuning.

The HF parameters of HBAUD 300 and MAXFRAME 1 should be stored in one of the 2 NOVRAM banks. If you are a BBS or MSO the DWAIT should be set to 4. (Ed. note - See "HF Packet Parameter Recommendations" following this article.) When resetting the HF parameters the error message "HDLC can't init" will come up. There is an error in the software. Version 3.2 seemed to work anyway; but in order to get 3.3 to work you must switch to "conversation" mode and send a few characters to your dummy load. You can then return to command mode and the TNC will operate correctly.

For improved input filtering I was able to get the 500 hz CW filter on my Kenwood TS-520SE to work in SSB by changing the existing diode switch wiring. Due to the difference in carrier frequency used for CW and LSB it came out with a passband that passes the TNC tones in both transmit and receive. If you need information on that modification contact me. It is a 30 minute no cost modification.

Because the two tones on HF are only 200 hz apart it does not matter what header you have on the input filter to the TNC. Calling frequencies for HF packet are 14.103, 10.149, 7.097, 3.642 and 3.630 mhz.

HF Packet Parameter Recommendations

In case you haven't noticed, the packet activity on 14.103 has reached the point of forced QSYs of individual QSOs because of BBS activity.

Due to this increased activity, some thought should be given to the differences between HF and VHF operation. A few parameter changes will significantly improve channel throughput not only for BBS stations but for individual QSOs on the same frequency.

When the frequency is relatively quiet and a good path exists, everything proceeds just as it would on VHF. But, as is often the case with HF, the trouble starts when things are less than perfect.

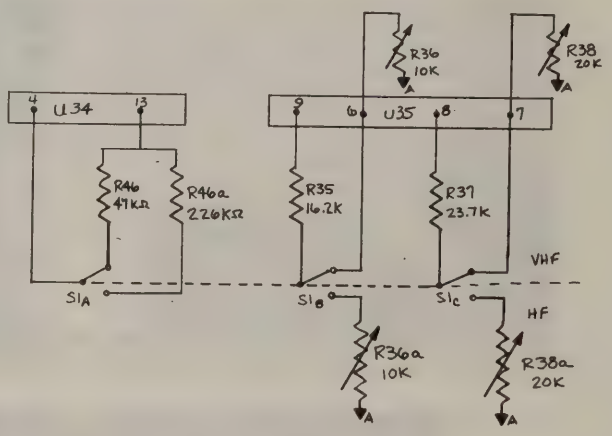
What happens when the channel is in a condition that requires retries? The following examples apply to a BBS or file transfer and can occur if you manually type in data while your TNC is holding off due to a DCD.

The TAPR software MAXFRAME is set to 4 by default. This means that up to a maximum of 4 frames (packets) can be sent in a continuous transmission. On a good channel this is very efficient as the end flags for one packet become the start flags for another saving some bit time on the frequency. Also, the receiver CAN send one ACK for all 4 packets.

Lets assume the sending station sets his MAXFRAME at the maximum value of 7 and has a total backlog of 25 packets. Due to propagation many packets will collide with unheard packets and others will suffer bit errors (fading, static, etc). The system sends a transmission of 7 packets and receives an ACK for the first but an error report on the second. The TNC dutifully resends all packets after the first and adds another up to the MAXFRAME value of 7. Due to conditions, on the next try, the first packet is in error but some of the others make it through. All 7 packets are again retransmitted as the retry is set up to resend all packets after the last one received correctly. This process continues until the sending station melts down his finals, gets all 25 packets through, or retries out. If there is an error in the second frame of each transmission, the end result would be sending 7*25 or 175 packets to get the file through. Had MAXFRAME been set to 1 and every packet sent twice, the total would have been only 2*25 or 50 packets. Watch a BBS or file transfer some time on HF or a noisy VHF circuit and see what happens. The result is the same lengthy data transfered over and over.

Recommendations:
1. Set MAXFRAME to 1.
2. Set your BBS DWAIT to 4.
3. Set PACLEN to 80 or less.
4. PERM, PERM, PERM.
5. QSY for long file transfers.

As conditions improve, the recommended values can be changed to optimize throughput.



▼A = AUDIO GROUND IN "MODEM" AREA

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R-46a	RES.	271-1350	$ .39

XEROX 820 NEWS

REVERSE VIDEO MODIFICATION FOR THE XEROX 820

Neil Earnhardt, WA3QFN

Have you ever wanted to be able to more easily distinquish between the packets you send and the ones coming in? Have you set up your favorite word processor like Wordstar on the 820 as an ADM-3 and been disappointed with the menus not in reverse video as you have seen on other computers? Well, here is the solution, a reverse video modification for the 820.

I wanted to be able to have reverse video on my 820 so at first I set out to design my own modification. I was successful with this modification, but as always happens, about the time I was just about done I came upon an article in Micro Cornucopia magazine. This article by Andrew Beck in the December 1981 issue was originally for a Big Board computer. I have simply adapted it for the Xerox 820 as the 820 is just an adaptation of the original Jim Ferguson Big Board. By the way, for this reason a lot of the articles written for the Big Board are adaptable to the Xerox 820. The difficulty is that Xerox renamed all the ICs so you have to do a little close comparison to figure it out.

The schematic (below) is redrawn and modified slightly from the one that appeared in the original article. The U numbers are for the Xerox board and should match the ones on your schematics and board. There are a few ICs that must have pins reassigned and one new IC must be added. A 74LS86 exclusive-OR gate is added in the "spare" position at U35. The spare position is for a 16 pin device and the LS86 is only a 14 pin so be sure to place the IC all the way toward the top and jumper the ground from the old pin 8 to the LS86's pin 7. This will provide the IC with 5V and ground. You will need to rewire a few pins on two ICs, U33 and U32. The easiest way to free the pins that are to be reassigned is to remove the chip from the board and place it back in a socket allowing the reassigned pins to "hang out". When inserting U33 allow pins 5 and 6 to hang out. On U32 allow pins 8 and 9 to hang out. Then connect jumpers as follows (The new wires are shown in bold lines on the schematic.):

U33 pin 5 to U33 pin 8
U33 pin 2 to U33 pin 4
U33 pin 6 to U35 pin 12

U35 pin 13 to U35 pin 14 (Vcc)
U35 pin 11 to U32 pin 9
U35 pin 10 to U91 pi 10
U35 pin 9 to u90 pin 6 (see note below)
U35 pin 8 to U34 pin 2 (see note below)

U32 pin 8 to U91 pin 11

Note: On some Xerox 820 boards there is a modification that has been done to add a 74LS74 in the U34 position as shown on my schematic. The above table assumes that this modification has been made. If it has not, you may want to add it or you could just insert the exclusive-OR gate (U35 pins 9 and 8) in series with what you now have, probably an inverter in the U89 package.

For those of you who like to know how things work, here is a brief circuit description. The circuit works in combination with software to reverse an individual character's video output by using the high bit of RAM. Previously this bit was used to flash the cursor. This modification removes the flash capability but provides a reverse video block cursor in its place. When the character generator EPROM is addressed from screen RAM the high bit (bit 7) is also set to a high if reverse video is desired for this character. This bit is ANDED with some disables, which I will discuss in a minute, and then latched into U91 with the output of the character generator EPROM U92. As the character data is shifted out of U90, U35 inverts the data if the input on pin 10 is high. If the screen RAM's bit 7 is a low (logic 0) then the input to pin 10 is a low so no data inversion will take place. In order to avoid the flashing of white spots on the screen during CPU access of video RAM, or during horizontal and vertical sync, the reverse video function is disabled by the logic connected to u16 pin 9 and U33 pin 8.

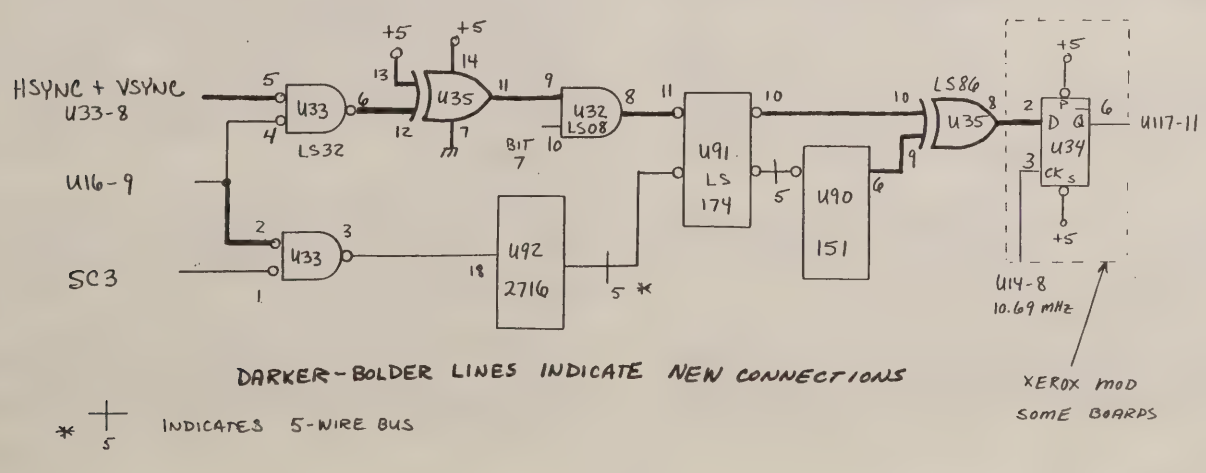
Now that you have gotten this far, here's how to test it. Upon powering up you should get a reverse video block with a small piece of a line missing from the bottom. This is a reverse video underline! This should move across the screen as you type. To change this cursor on a standard 820 you need to change byte FF77 hex to 02h. This is the character that the Xerox monitor uses if the cursor is on a space, otherwise it will reverse the character the cursor is on. The rest of the testing requires making some software mods to your video routines to fully take advantage of the modification. These routines are all in EPROM at power on and are moved to high RAM after reset. I'm not too familiar with the 820 standard EPROM as I have modified the Emerald double density EPROM to handle the reverse video routines.

For those of you with Emerald EPROMs here is the modification to drive the reverse video function. Change the following bytes in U63:

01BC from CB to 00
01BD from B9 to 00
01D3 from FE to 00
01D4 from 61 to 00
01D5 from 38 to 00
01D6 from 03 to 00
01D7 from E6 to F6
01D8 from 1F to 80

With the above EPROM mods you can use reverse video in your own programs by setting the high bit (ori 80h) just before calling the CONOUT routine in CP/M. Also you can use reverse video in programs like Wordstar by telling it that reverse video is turned on with "ESC g" and turned off with "ESC a". See Wordstar's patcher routines in the manual and patch "ivon" and "ivoff" as above. Also while you are in the patcher.... all 820s support "clear to end of line" and you should patch "eraeol" with control x (18h). This will make Wordstar faster. Also reverse video can be turned on under CP/M by just typing ESC g and return. CP/M will give an error but all characters output following will be in reverse video. Typing ESC a will put you back to normal.

I hope this will turn into a monthly feature on 820 news, so if you have anything interesting that you have done to your 820 please send it in to the editor to be included in this column.



THE 220 MHZ EXPERIMENT

DON DEEM, KB4LLO

For sometime we in FADCA have been discussing 9600 baud packet on the 220 MHz band. While some testing was done in the past on 220 MHz, little data was available to enable us to set up a test network to run propagation and other tests. At present, testing is in progress on the East coast with two prototype 9600 baud modems. Word has it that those units may be ready for field testing in the very near future.

This report will detail how we in the Tampa Bay LAN set about the task of testing and data collection, and the information we have collected to date. This is by no means a finalized report as it only covers the first of many tests we plan to perform in the near furture. We present this information to you in the hope that more of you around the state will join us in state-wide testing, so that we can put together the Gator-1 network as soon as the digital and RF gear is available.

On Sunday morning, June 2, 1985, a motley crew of interested individuals arose earlier than usual (much earlier for KF4EF, HI) and began converging on Brandon. The plan was to meet at Gwyn's home and layout the testing effort for that day. After the usual good mornings, and where's the coffee, etc. the field crew (Pat-KF4EF, Jim-W4APV, and Rick-KB4CIA) piled into a truck and headed for the Lake Wales repeater site. Gwyn and I manned the fixed location. Our goal was to determine, under what we considered to be average conditions, just how far we could communicate via voice and packet radio on 220 MHz and compare that to propagation on 145 MHz.

The Lake Wales site was selected for two reasons. First was availability and second was the fact that this 550 foot tower is located on a hill 100 feet above sea-level. For the link from coast to coast this looks like a good place to start.

The first test was performed from approximately 30 miles East of Gwyn's qth in the Mulberry area. The test setup was as follows:

The mobile station was a Midland 13-509 at 10 watts, with a low noise receive preamp. The antenna was an 11 element beam at 18ft. and the coax was RG-8A/U. The base setup was again a Midland 13-509 at 10 watts The antenna was a Cushcraft 220MHZ Boomer beam at 60ft., fed by 75 ohm CATV hardline.

This was a voice test providing an S-9 + 40db signal both ways. The voice test was so good that we decided not to try packet radio at this site.

The second test site was at the Lake Wales tower. The test setup was as follows:

The mobile station was the same except for the addition of a 100 watt power amplifier. The beam antenna was raised to 25ft. The base station was the same as previously stated.

Both voice and packet transmissions were made from the Lake Wales site, and the results were exciting! The voice transmissions were virtually full scale at the Brandon base with a noticable flutter. From Gwyn's station to Lake Wales the signals were weak but readable (only 10 watts remember). Pat sent 50 beacon packets to us and we received 47 of them, first try. Packets sent from Brandon to Lake Wales were not readable by the TNC, but were clearly heard by the field crew. I suspect there was a radio to TNC audio level problem. Brandon to Lake Wales is approx. 45 miles.

As you can see, this was not exactly a controlled scientific experiment, but the evidence indicates that we may be able to span the state in one hop by careful selection of equipment, and a solid installation at Lake Wales. Hopefully, we will be able to improve on the 94% success rate of this test at some time in the future.

The Tampa LAN is setting up a 220 MHZ voice network at the present time. We presently have the following active stations:

PAT KF4EF--Tampa JIM W4APV--St. Pete
DON KB4LLO-Bradenton ED K1SSH---Venice
RICK KB4CIA-Pt. Charlotte

Once we have the bugs out of our RF system, we will start operating at 1200 baud until we are able to acquire the necessary hardware to convert to 9600 baud. We also have a 220 MHZ voice/packet repeater in the works. Rick KB4CIA will keep us informed of his progress. As you can see the Tampa LAN is making 220 MHZ packet a reality here. We hope to have an active network in operation when the 9600 baud hardware becomes available and conversion becomes possible.

If you are interested in packet on 220 MHZ and would like to join our effort, we invite you to drop us a line indicating your interest. Let's get on with 220 packet.

GATOR-1 9600 BAUD MODEMS

Tom Kneisel, K4GFG

The 9600 baud modems and RF gear were successfully demonstrated at the Packetfest in Gainesville. TAPR TNC's with 9600 baud modems attached were outfitted to each of two Hamtronics FM-5 transceivers, and packets exchanged on 220 Mhz.

One of the modems demonstrated at Gainesville was built on a prototype pc board received from TAPR. It looks like a second pass pc board will be required to fix a few bugs, but after patching in the fixes, the modem functioned as expected.

The Hamtronics transceivers have continued to resist attempts to tame their transmit spurious oscillations. My best guess at the moment is that RF is spraying from the output circuits back into the low power driver stages causing regeneration. In order to ready the units for demonstration at Gainesville, I had to disable the final PA and draw power from the driver stage. The driver is capable of supplying about 3.5 - 4 watts of relatively stable power.

After much discussion at Gainesville, I remain convinced that 220 Mhz is the proper place for our linking efforts. During the next month both the modem and the radio will undergo extensive testing on the bench. I will continue working on solutions for the problems of the FM-5, but will also search for alternative equipment as time permits.

Despite the apparent success demonstrated at Gainesville, there remain several problems to be solved before groups can begin installation of the GATOR-1 backbone network. It should be noted that we are not alone in our evaluation of the modems and search for suitable RF gear. Other people across the country are doing the same, and I imagine their groups are as anxious as we are to improve LAN linking.

STUDENTS CHARMED BY PACKET RACKET

JOE BURNHAM, WD4KAV

A NUMBER OF SEVENTH GRADE STUDENTS AT STUART MIDDLE SCHOOL GOT AN INTRODUCTION TO THE MANY FACETS OF HAM RADIO (INCLUDING PACKET) MAY 29TH. BRUCE REID (WB9SHT), AN INDUSTRIAL ARTS INSTRUCTOR AT THE SCHOOL, WANTED TO END THE YEAR WITH A BANG, SO HE RECRUITED PAUL HARRISON (KI4MG), GEORGE DAILY (W3WU), THOM SCOTT (KA4LIF), AND MYSELF TO SET UP AND OPERATE FROM THE SHOP AREA ALL DAY.

THE STUDENTS SAW IT ALL, FROM 40 METER H.F. (PAUL), RULES AND REGS (AND CW!) (GEORGE), SHORTWAVE LISTENING (BRUCE), AND PACKET (THOM AND MYSELF). THE PACKET STATION (CONTRIBUTED BY THOM) GENERATED CONSISTENTLY HIGH INTEREST THROUGH ALL SEVEN (!) PERIODS. IN ALL FAIRNESS TO PAUL, IT MUST BE ADDED THAT LOW BAND CONTACTS WERE FEW AND FAR BETWEEN, DUE TO POOR BND CONDITIONS, WHILE THE PACKET SET-UP BENEFITED FROM THE DEDICATED (AND UNDERSTANDING) EFFORTS OF LADD (W2KGV) IN PT. ST. LUCIE, AND WARREN (N4GBM) AND ERNIE (K4OSM) IN OCALA. BOB (WD4BIW) ALSO MADE AN APPEARENCE EARLY IN THE MORNING.

THE KIDS GOT "HANDS ON" EXPERIENCE AT THE KEYBOARD AND SOME GIRLS ASKED THEIR PACKET CONTACTS IF THEY WERE SINGLE, HAD GIRLFRIENDS, OR WHETHER THEY WERE REPUBLICAN OR DEMOCRAT!!! ONE SEVENTH GRADE LASS EVEN WALKED UP TO ME AND SAID "OH... YOU MEAN THIS IS JUST LIKE TELECOMMUNICATIONS?!!"

THE GENERAL FEELING OF ALL OF US AT DAYS END WAS THAT IT WAS WORTH THE EFFORT, AND EACH OF US SEEMED TO REMEMBER AT LEAST ONE STUDENT WHO SHOWED MORE THAN PASSING INTEREST IN WHAT WAS HAPPENING, AND MIGHT ONE DAY BECOME A HAM.

NON - ELECTRONIC MAIL

1421 Hampton Ridge Road
Norcross, GA 30093
June 17, 1985

FADCA
812 Childers Loop
Brandon, FL 33511

Dear Gwyn,

On behald of all the Georgia packeteers that attended the recent SOUTHNET Packet Conference in Gainesville, I would like to say thank you for your outstanding hospitality. We felt very welcome by our fellow packeteers and thoroughly enjoyed the entire proceedings of the conference. With the formal formulation of SOUTHNET I believe we will be able to significantly advance packet radio in the Southeast and also contribute to national efforts. In addition, our hats are off to the Gator Amateur Radio Club for handling the logistics of this event. I hope that we can do as well later this year when we plan to host the next Southnet Conference here in Atlanta.

We'll be looking forward to meeting all of you again. If you have the time, come up to the Atlanta Hamfestival on July 6 & 7.

Best 73,
Bill Crews, WB2CPV
Editor, "THE GRAPEVINE"

AUTOMATIC PACKET RADIO (a letter to Howard Goldstein, N2WX)

Howie:

One of the advantages of packet radio is that we can make the RF links invisible to the user! One of the requirements for such a system is available now in the form of remotely controllable radios (for example - the ICOM 701 and COLLINS KWM-380). With the addition of another box to the average HF packet communications system, virtually effortless communications between two stations can be possible.

The new box is a radio controller with the intelligence to process the information the packet node controller is dishing out. Here is what I have in mind. The line up of equipment would be: RS-232 terminal (ANSI please!), the radio controller, the packet terminal node controller, and then the HF radio. The HF radio remote control output is connected back to the radio controller.

Several frequencies would need to be "allocated" to permit the radio controller to scan for calls and generally check out the band for propagation. For example, 10.117, 10.119, 10.121, 10.123 could be set up as packet frequencies (only an example!). This gives some guard space between adjacent operations for these guys that have rigs with "exact frequency" operation. It might even be reasonable to run this with a -18 db carrier or as FM to provide some AFC action for sloppy receivers.

Operation consists of telling the radio controller what to look for and then sitting back and watching the radio controller systematically scan each of the frequencies (maybe 15-30 seconds per channel). The TNC dumps what it hears into the radio controller that then provides the operator with status reports (calls heard or amount of activity per channel). When the desired station is found, connection requests can be generated and the two operators talk, or whatever. When the packet equivalent of calling CQ is desired, the radio controller can check for the least busy frequency of the list and proceed to beacon it's heart away.

Now for the good part. You want to work W1AW (say you have your latest VE results for them and want to leave them in their VE news mailbox) but the radio controller tells you all you are hearing is 3's. If the right amount of artificial intelligence or if some stations can function as a "central office" (CO) adjacent central offices (not necessarily on the same set of frequencies as everbody else) to a CO near W1AW and attempts to access again. After a dozen or two tries on the frequencies in the area (a CO can have access to VHF/UHF too), a " not available" result is generated and the operator can schedule another attempt at a later time. Of course, it doesn't just have to be on HF, the same equipment and philosophy could apply to VHF as well.

I guess first we have to get the rights to have automatic operation of radio stations. Second, we are going to need some of the well-funded repeater groups and clubs start seriously thinking about putting on digital repeaters and possibly buying things like DEC microVAXes, Wang PC's with the 80286/80287 upgrade, IBM PC/AT's, etc. These will be the central offices. These offices must have the sme functionality so that they can be used by all reguardless if the user is local or chained to them through a dozen or more connections. All software for the central offices should be written in Pascal or C or ADA or something to make it as absolutly machine independent as possible (just need to write the drivers for a "non-standard" machine) and possibly require certification by a "packet radio standards committee" to provide some assurance of conformance to the standard in use in the system.

Bill Newkirk, WB9IVR
3151 S. Babcock St., #70
Melbourne, Fl 32901-6957

EXCERPTS FROM OTHER PUBLICATIONS

Reprinted from Digital Radio Net (DRNET)

J. Gordon Beattie Jr. (N2DSY,2990) 6/ 2/85 3:19 AM
KEYS:/ROUTING/ADDRESSING/

I am wondering if we aren't confusing the routing and addressing issues a bit ? The new W0RLI software supports the addressing format W1XXX@W0RLI. It has been noted that we really don't know how to properly locate W0RLI. We certainly don't want to start the message off to the central part of the U.S. ! Network routing will probably end up being geographical in nature and it will probably use grid squares, telephone area codes, airport id's or CCITT X.121. Now if the sender doesn't have a rough idea what the approximate location of his correspondent is, then he probably can't expect to get the traffic through. That can be fixed using various inquiry facilities noted elsewhere. Once a basic network address has been linked to the callsign of the destination system, traffic can be locally generated and forwarded reliably to the desti nation. If the local system keeps a table of PBBS callsigns or even names (who needs callsigns except the FCC ?) the user can use the format W1XXX@W0RLI or K2KLN@METROPLEX. If the local system does not keep this information then the user would use the format: W1XXX@W0RLI/03100603. The local PBBS would then place a call to W0RLI on the amateur packet network in the U.S. state of New Hampshire.
Your comments please...

Wes Morris (K7PYK,2984) 6/17/85 2:58 AM
KEYS:/BINARY FILES/

Sunday, June 16, 1984...finally a breakthrough...
Tonight Art (w1fji) and I (k7pyk) transferred binary files using TAPR tnc's and "pmodem.exe". Pmodem was written by skip Hansen (wb6ymh) and modified for the "pc" by Tom Cain (wb8oue). The source code is for C-Systems compiler. If anybody's interested leave a note here or on one of the pbbs's

73 signed Wes

Paul Newland (ad7i,2978) 6/20/85 7:28 AM
KEYS:/MF10 FILTER DESIGN PROGRAMS/
TO: all radio amateurs
SUBJ: MF10 filter programs
DIST: open

I have received from National Semiconductor programs to aid designing filters using their MF10 series of ICs. I have been told that these programs CAN be passed around. They are written in BASIC.

If you would like a copy please send me either a formatted SSSD 8 inch CP/M diskette or a DSDD 5 inch MS-DOS diskette with a SASE and I will be happy to put the programs onto your disk and drop it into the mail for you.

Please note that I said SASE. If you send money (with the implicit suggestion that I should go to the post office and buy stamps for you) I will consider the money and the diskette a gift (Canadians excepted) and you will probably never see either of them again!

73, paul

C2974 CC8 J. Gordon Beattie Jr. (N2DSY,2990) 6/ 2/85
KEYS:HOW ABOUT SOME FREE PACKET SPECTRUM?/YOUR COMMENTS NEEDED !/

Hi Guys,

I have a provocative proposition for the Amateur Community. It has come to my attention that we have a nice slice of spectrum in the VHF bands which is ripe for use by packet users. It is the 51-52 MHz segment of 6 meters. Now before you go flying off the handle telling me how you KNOW ALL ABOUT TVI AND CHANNEL 2, let me point out a few features.

1. The segment has few, if any users in most areas.
2. There is PLENTY of surplus commercial gear.
3. There is amateur equipment CURRENTLY manufactured for this band directed at foreign markets (JAPAN, the rest of Asia)
4. It is easy to homebrew gear for this relatively low frequency.
5. It is easy to work with the antennas and feed systems on this band.
6. Packet operations on this band may lead to increased activity on this band using other modes.
7. This band has good propagation characteristics for the low rolling hills found in many areas of the country.
8. Transmitter power could be limited to the 1-5 Watt range to reduce the potential for problems with Channel 2. There is also a 2 MHz buffer between the 52 "top end" of this proposed packet spectrum and the low edge of television channel 2. That's a lot of room to work with. Besides our gear is more advanced than a Gonset or Knight 6m AM rig !
9. Twenty (!!!) wideband (9600 or better) channels could be placed on 50 kHz centers. As we move toward more advanced forms of modulation, the baud rate could remain the same and the bit rate could be extended to at least 32 kbits/sec or even 64 kbits/sec ! The channels could start at 51.025 and go to 51.975 MHz.

SOUTHNET statewide frequencies (Florida)

Primary LAN and calling freq:	145.010
Local QSOs & file xfers:	145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):	221.720, 221.780
Narrow bandwidth linking:	221.400 (20 KHz b/w)
Medium bandwidth linking :	220.570 (100 KHz b/w)

From K7PYK BBS

MSG#	T	R	SIZE	TO	FROM	DATE	TITLE
422	B	N	1831	ALL	K7PYK	850514	WHY TAPR KEPT TNC-2 SECRET

PETE EATON (WB9FLW,2970) 5/ 9/85 12:55 PM
KEYS:/WHY WAS TNC 2 KEPT SECRET? GOOD QUESTION WES!/

WES:

THE NEW TNC WAS KEPT UNDER WRAPS FOR SEVERAL REASONS. FIRST IN THE PAST TAPR HAD BEEN "JUMPED ON" FOR ANNOUNCING SOMETHING AND THEN NOT BEING ABLE TO DELIVER. THE TNC KIT WAS SHOWN OFF IN JUNE OF 1983, THERE WAS A LOT OF EXCITMENT, AND WE THOUGHT WE COULD DELIVER QUICKLY. THE BOTTOM LINE WAS IT TOOK TILL DECEMBER OF THAT YEAR TO SHIP THE FIRST 100, AND WE HAD 400 ORDERS BEFORE WE COULD EVEN SHIP, PEOPLE WERE UPSET THAT WE HAD "TAKEN THEIR MONEY" AND NOT DELIVERED. BUT WE NEVER ASKED FOR MONEY. PEOPLE JUST ASSUMED THEY COULD ORDER ONE, THUS 400 ORDERS, AND SOME HOT TEMPERS.

WE WERE NOT GOING TO GO THRU THAT AGAIN. TNC 2 TOOK A YEAR TO GET TO A "FINAL" FORM. IT'S STILL NOT READY TO SHIP, WE NEED PEACE AND QUIET TO GET THE JOB DONE, AND THUS ALL THE HUSH-HUSH STUFF. NOW IN HAM RADIO I HATE SECRET PROJECTS BUT THIS WAS AN EXCEPTION. WE HAD ONE OTHER THING THAT CAUSED US TO BE SO TIGHT LIPPED. OUR OLD TNC WAS SELLING WELL, ABOUT 150 A MONTH. WE HAD MOST OF TAPR'S MONEY TIED UP IN KIT PARTS FOR THE OLD UNIT. IF THE WORD ON THE NEW UNIT LEAKED OUT AND SALES DROPPED BECAUSE EVERYONE WANTED THE NEW CHEAPER ONE, TAPR WOULD GO BROKE, BELLY UP. NOW MAYBE THAT WOULDN'T HAVE HAPPENED, MAYBE SALES WOULD NOT HAVE DROPPED. WE WERE NOT WILLING TO TAKE THE CHANCE.

AS YOU CAN SEE WE WERE IN THE FAMOUS LOCATION BETWEEN "A ROCK AND A HARD PLACE". SOME FOLKS ARE UPSET WITH US FOR NOT BEING MORE OPEN ABOUT THE NEW PROJECT, SOME ARE REALLY EXCITED ABOUT THE NEW UNIT, SOME DON'T CARE. WE FELT IT WAS BETTER TO PLAY IT SAFE AND HOPE THAT FOLKS WOULD UNDERSTAND.

WE ARE NOT GOING TO BE SECRET ABOUT THINGS IN THE FUTURE; THIS WAS A SPECIAL CASE.

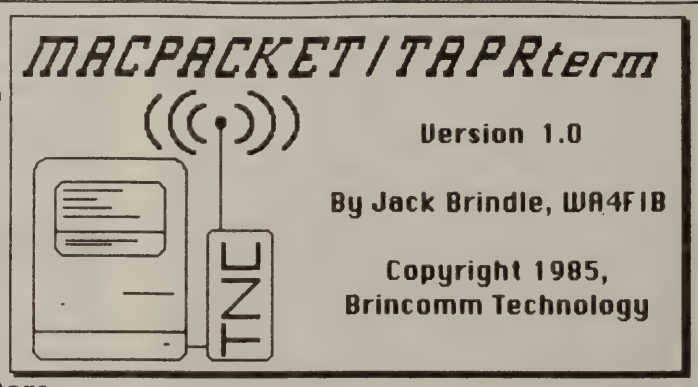
WOW, THAT WAS LONG WINDED! HOPE IT ANSWERED THE QUESTION! TAKE CARE & 73. PETE

File Edit Command Parameters Routing

MacPacket

MacPacket/TAPRterm is a "front-end processor" for the Apple Macintosh™ when used with the TAPR Terminal Node Controller.

Features:
- split screen display.
- file upload, download and printing.
- menu selection of tnc. commands and parameters.
- Compatible with AEA, Heath & TAPR tncs.



Send

- routing tables to aid in selection of route to destination station.
- list price of $39.95 includes all updates for one year.
- Shipping June 1!

For more information, contact:
Jack Brindle, WA4FIB
Brincomm Technology
19451 Gulf Blvd #503
Indian Rocks Beach, Fla 33535

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So You Want To Try Something New? How 'Bout The AEA Packet Breakthrough!

Because:

You want to recreate the thrill of your first ham contact!
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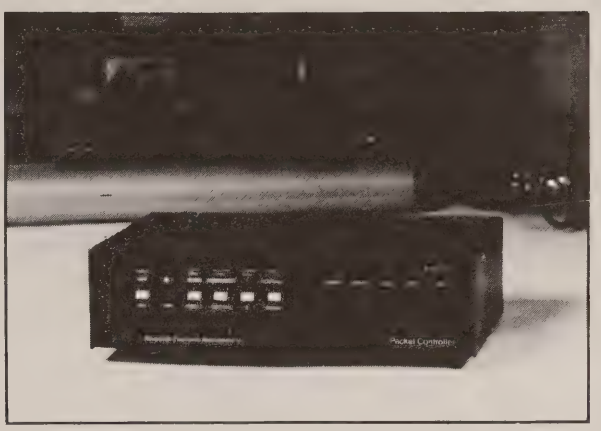
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.



In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5-6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

See your favorite AEA dealer, clip and send the coupon, or call John Gates, N7BTI (the AEA Packetman) at (206) 775-7373.

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OK AEA, send packet information to:

Name _____ Date _____
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FADCA>BEACON

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FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

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The deadline for inputs for the JULY issue of the FADCA > BEACON is JULY 16th. Articles are preferred in electronic form using a 55 character column width.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple
Half page	$17.00	issue contracts.
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a guaranteed monthly circulation of 250 copies, however that amount is normally doubled by introductory mailings and distribution at hamfests and demonstrations. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed:

January 1985	- 550	April 1985	- 500
February 1985	- 540	May 1985	- 500
March 1985	-1000	June 1985	- 500

DIGITAL EVENTS

JULY 6/7. Atlanta Hamfestival. Packet forum Saturday at 11 AM. Contact GRAPES.

AUG 3/4. Jacksonville Hamfest. Packet demonstration and FADCA dinner. Contact W4PCM.

OCT 12/13. South Florida ARRL Suncoast Convention St. Petersburg. Two full days of packet activities. Contact W1BEL.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

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ASSOCIATION, INCORPORATED (FADCA)
812 Childers Loop, Brandon, FL 33511

FADCA BADGES ARE AVAILABLE NOW!!!

YELLOW, GOLD OR SALMON COLORS
BADGES ARE 2-1/4" ROUND WITH LOCKING PIN ON BACKSIDE
$1.00 WITHOUT CALL LETTERS, $2.00 WITH CALL LETTERS

SEND YOUR CHECK AND ORDER TO FADCA.

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 7 Brandon, Florida July 1985

NEW TNC FOR COMMODORE 64 FROM A. E. A.

A.E.A has announced the PK-64, the first packet system with both hardware and software optimized for the Commodore 64 computer.

On the hardware side the PK-64 includes the Western Digital 1935 HDLC chip for full-duplex operation. The modem is based on the Exar 2206 and 2211 chip set including a 6-pole post detection filter for improved HF and VHF performance. The PK-64 is designed for small size and light weight to be as convenient to use as possible. A.E.A designed the PK-64 to operate from 12 Volts DC for maximum flexibility in powering the unit. An AC adapter is available from A.E.A for those wishing to use a 115 VAC power source. The PK-64 will work with virtually any voice transceiver.

The hardware is only half the story. No packet radio controller is complete without appropriate communications software. Existing terminal emulation programs used with present packet controllers were not designed with packet radio communication in mind and are not optimum. The PK-64 includes its own MBA-TOR(tm) style communications software which has been optimized for packet radio.

The PK-64 software allows split screen operation for more efficient packet radio communications. This is a valuable feature since it allows receiving and displaying packets while the operator is typing a message or response to be transmitted. There is a built-in word processor style text editor that allows disk or cassette files to be created, edited, or deleted. Commodore 64 text and executable files may be transferred error-free with the PK-64. Ten command and message buffers are available for traffic, bulletins, or often used connect paths etc. A software clock is included which automatically logs the connect and disconnect times and dates. PK-64 commands are the same style as the TAPR family of commands.

A.E.A plans to introduce the PK-64 at a price of less than $220, with initial production and delivery beginning in September. With all the features and low price the PK-64 will prove to be a great performer and an exceptional value in packet radio communications.

For more information, contact A.E.A at POB C-2160, Lynwood, WA 98036. (206) 775-7373.

MODIFIED W0RLI BBS BEING TESTED

Jim Scalf, K4TKU
10445 S.W. 70th Ave.
Miami, FL 33156

A heavily modified version of the excellent W0RLI mailbox has been operating on a test basis since mid-May in the Miami area. The software modifications were done by my brother Bob, K4EID, who has been operating the modified mailbox in the Knoxville, Tennessee area for the past few months. The program appears to be working well after correcting a few early "operational" bugs. Early reports from users indicate good operating speed and easy use.

There were several reasons for the modifications to the W0RLI software. The primary reason was that it was written to run only on the Xerox 820 computer and was totally dependent on the Xerox BIOS AND ROMS. In its original form it could not be used on any other computer system. An assembly listing of the original program (Rev. 6.7) was difficult to follow because of the use of approx. 71 special macros. In order to use it on some other computers and add some enhancements, Bob eliminated all of the special macros, streamlined much of the code, reduced the configuration file by about two-thirds, eliminated the use of the IOBYTE for port selection and the dependency on the Xerox 820 BIOS and ROMS and incorporated SIO and TNC set-up code into the initialization section. Optional software XON/XOFF flow control was provided and may create some problems in a few modes such as uploading large files. The result is an operating mailbox (and gateway after a few more mods) on a Digital Research Computers Big Board computer with two 674K double density drives.The real beauty of the re-written software is that it makes it possible to modify and re-assemble the program to run on other Z-80 based computer systems. Two stations in the Miami area are now running the W0RLI software. Bill, NK4K, has just received the latest version (Version 9.5) of the RLI software and is

Continued on page 3.

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

Digipeater Calls

Last month in the FADCA>BEACON I proposed that wide area digipeaters use their Local Area Network city name as their call letters. As of July 14th N2WX-7 and K4NTA-1 answer to their call letters or MLB for N2WX-7 and STU for K4NTA-1. Howie N2WX was able to modify his digipeater program on the Xerox 820 to accept either the call or the name. FADCA has set a target date of August 15th for all Florida wide area LAN digipeaters to adopt this procedure. It is recongized that TAPR and GLB digipeaters will not be able to use both the call and the city name.

For TAPR, AEA and Heathkit TNCs we suggest that the MYCALL be changed to the LAN city name as shown on the FADCA map in the BEACON and PERMed in. For example WA4ARE-1 becomes WPB and we suggest that the beacon be set to BEACON EVERY 60 with a BTEXT something like "de WA4ARE/R digipeater WPB - West Palm Beach, FL." Sending this ID beacon every 10 minutes will satisfy the FCC requirement for repeater ID. The catch is that if the TNC looses power, the BTEXT is lost and the B E 60 reverts to B E 0. To solve this problem, we are tring to find out how to patch the EPROM so that the default beacon time will be 60 and the BTEXT will be our ID beacon for that particular digipeater. Another solution for this problem is to power the TNC with a battery so that it never looses power. Still another method of IDing is for a local home station to set his UNPROTO to repeat VIA the digipeater and set his BTEXT so that it will ID the digipeater when the beacon is repeated.

Continued on page 8.

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Naples Digipeater
FADCA Director Ballot (memb only)
Non-Electronic Mail
The Junkbox - New and Used Parts
Excerpts From Other Publications
Advertisements
FADCA Nets and Packet Frequencies

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Because:

You want to recreate the thrill of your first ham contact!
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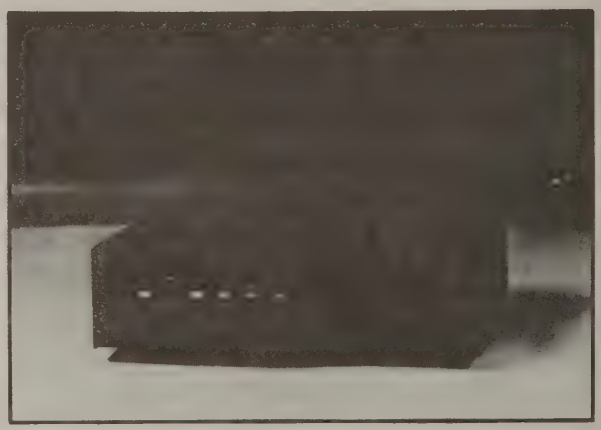
You want to send error-free messages on HF/VHF/Satellite in spite of QRM!
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.



In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5-6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

See your favorite AEA dealer, clip and send the coupon, or call John Gates, N7BTI (the AEA Packetman) at (206) 775-7373.

AEA INC., P.O. BOX C-2160, LYNNWOOD, WA 98036
OK AEA, send packet information to:

Name _____ Date _____
Street _____
City, State _____
Zip _____ Call me at _____

Advanced Electronic Applications, Inc.
P.O. BOX C-2160 • LYNNWOOD, WA 98036
(206) 775-7373 • TELEX: 152571 AEA INTL

W0RLI MAILBOX / GATEWAY - version 9.5

- - - Commands that control the system:

B - Bye, log out of the MailBox.
Forced if no response to a menu in 4 minutes.

G - Activate the GateWay.

H - Display the help text.

I - Display information about the system.

J - Display the calls of stations recently heard or connected.

T - Talk to Hank. Dings the bell on the local terminal.
Gives up after one minute, or input from the TNC.

X - Toggle between the short and long form of the menu.

- - - Commands that apply to messages:

K - Kill a Message.
Qualifier:
T - Used to kill traffic after it is taken.
Argument - Message number.

L - List message headers.
Qualifier:
None - List all messages entered since you last logged in.
B - List bulletins only.
L - List the last N messages.
M - List messages addressed to you only.
T - List NTS traffic only.
> - List messages TO call given as argument.
< - List messages FROM call given as argument.
Argument - Number of the oldest message to list.
For LL, the number of messages to list.
For L< and L>, the call.

R - Read a message.
Argument - Message number to read.

S - Send a message.
Qualifier:
None - A general message.
B - A bulletin.
P - A private message.
T - traffic for the NTS.
Argument - Call of addressee.

The form: "S call1 @ call2" is also supported.
call1 is the addressee, call2 is the bbs to forward
the message to. Example: SP K1KSY @ WORLI

- - - Commands that apply to file transfers:

The MailBox expects standard CP/M filenames:
8 character maximum name, 3 character maximum extension.
Examples: DOC.TNC HFCALLS.HRD CALLS.HRD

D - Download a file FROM the MailBox.
Argument - Name of file to transmit.

U - Upload a file TO the MailBox.
Argument - Name the file will have.
Terminate the file with ^Z (CTL-Z).

W - What files are available.
Argument - If present, filespec to list.

- - - Commands on the GateWay menu:

C - Attempt a connection.
Argument: Call of station to connect to, may include digipeater
routing, for example: C N1CB via KD2S-1,WA1TLN-1

J - Display the calls of stations recently heard or connected.

U - Call CQ. Whatever you transmit will be transmitted through
the other TNC in UNPROTOCOL mode.

R - Return to the MailBox (Discontinue GateWay operation).

News From South Carolina

Rip, W4FX

(Reprinted from the GRAPEVINE, July 1985.)

The South Carolina Packet Enthusiast Society was formed on July 10, 1985 and will be known as SCRAPES from here on out. An organizational meeting will be held in Columbia, SC on Aug 10 at 10 AM at a place yet to be announced.

The following stations are known to be on packet in South Carolina: WA4SZK (and 5 others) in Florence, N4EOY in Lexington, KJ4X in Pickens, KA4YEA in Anderson, WB4OQL in Greer, and W4FX in Anderson. Western SC stations can be reached via W4FX-0, and later on by W4FX-1 on Sassafras Mountain. N4EOY and Florence stations can be reached via W4ULH-1.

****

Effective Monday June 17th TAPR has a new Office Manager. The voice you will hear when calling the office will be that of "Chris" Kurz.

Chris has spent the last week training with Lyle Johnson's wife Heather. Both these gals have been working very hard to get things in order so that future TAPR business (like TNC 2) can be handled quickly, AND correctly.

If you have any outstanding, or new business with TAPR give us a call. Chris will do her best to help you.

****

MODIFIED WORLI Continued

currently testing it with his Xerox 820. The WORLI software revision 9.5 offers several new features. Although plans are tentative, K4EID is working on a modified version of this latest release for use on other computer systems. For those not familiar with the WORLI Mailbox and Gateway, a listing of the commands appears in this issue of the BEACON.

There is no special log-in procedure. Each station is automatically logged in when connected and all unread messages are listed for the user. The beacon, when enabled, lists stations having unread mail. There is one important characteristic to keep in mind -- if there is no keyboard input from the connected station in four (4) minutes, the mailbox will automatically terminate the connection and log the user off. More importantly, if a user just "goes away" or loses the connection (reboots, turns his radio off, exceeds retry count, etc.) the mailbox will not respond to another user until the four minute timer has expired and logins are again permitted.

In summary, we are off to a good start and hope to continue to make progress. Miami stations who access the K4TKU board are encouraged to leave comments and suggestions so that any bugs can be identified and corrected.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

I want to tell you about my short vacation over the July Fourth holiday. I set up a packet mobile station consisting of the TAPR TNC2, Radio Shack Model 100, Icom IC-02AT, TE Systems 160 watt amp-GaAsFET preamp, and a 5/8 wave roof mounted antenna. Everything was powered by the automobile battery except for the Model 100 which used a 6v gel cell. (Future mobile activities will be assisted by a Model 100 power cord including a voltage regulator.)

There were two very enjoyable aspects to the week long mobile operation. One was the entertainment value of the packet setup while driving long distances. The Model 100 fits comfortably on the console between the front seats in my vehicle and the display can be read easily in a short glance. One handed typing can be a problem for the driver, but roadside stops can be made if a contact results or the co-pilot/navigator/passenger can be pressed into service. Overall the setup improved my alertness by avoiding boredom on the long driving days.

The second source of fun was the nice packet people I met as I drove through their area. There is considerable packet activity in the Carolinas and Virginia, and the no-mans-land that appears on Eastnet and SOUTHNET maps does not exist. There is just lack of information on the details of the activity in the hands of the mapmakers. We hope to cure that for the next edition of the SOUTHNET map and callsign directory.

Some operator comments based on my mobile and previous portable experience: In this time of manual linking that uses operator supplied digipeater routings, a person without a map or listing of the existing digipeaters and their geographic relationship is unable to make use of the network. I was fortunate to have SOUTHNET and Eastnet maps that gave me an idea of the location and callsigns of digipeaters. Since my travel was during daylight hours most of the time, and most packet activity occurs during the evening, I could not depend on casual monitoring to determine stations within my range at any time. Beacons from the digipeaters served to help define my area of coverage as I moved along. I was very desirous of a network command that would let me request stations within range of my signal to identify; like a broadcast WRU. My mobile beacons were intercepted by a number of human operators and nice contacts resulted. My beacons were digipeated through the closest KNOWN digipeater and their retransmission monitored, but there must have been many stations within range as I passed by that I never knew of and had no way to discover. Mobile packet is a unique mode of operating at this time, but has been tried by an increasing number of folks since 1983. Portable operation will be even more commonplace than mobile. Network designers should provide full support for these forms of operation.

Some of you may be aware that I have assumed duties as editor of the TAPR newsletter, now named PSR Quarterly. I accepted that job only after assuring myself that I could do it without decreasing the quality of the BEACON. With the first edition of the PSR completed, I find I must recommend that BEACON readers take a look at the PSR Quarterly and have recommended that PSR readers investigate the BEACON. There is so much good techincal and operational news available for print that even two publications cannot provide complete coverage. For those of you that receive both publications, there will be some overlap, but not an excessive amount. Your comments are welcomed.

My vacation included enjoyable two days at the Atlanta Hamfest. The GRAPES put on several seminars and operated a booth in the commercial area. They did an excellent job in all respects and the amount of attention shown by the hamfest attendees was impressive. Very few people stop by anymore and ask "what is packet". They do ask how it works and what equipment is best, but they are already aware of the mode's existence. Occasionally a person known for technical expertise will stop by for more information, so they can catch up with this new development. I hope all the 'slick' magazine writers will do their homework before they publish.

Included this month is a listing of the TNC2 commands as they are expected to appear in the first set delivered. Still no word on when the 'call-in' day for the TNC2 will be, but watch your local Mailbox for the announcement. There is planned to be enough time allowed for the word about 'call-in' day to get around.

DIGITAL EVENTS

AUG 3/4. Jacksonville Hamfest. Packet demonstration and FADCA dinner. Contact W4PCM.
AUG 24. Broward "PACnic", CB Smith Park, 11 AM.
SEP 7/8. Melbourne Hamfest. Contact N2WX.
OCT 12/13. South Florida ARRL Suncoast Convention in St. Petersburg. Two full days of packet activities. Contact KB4LLO.
OCT 12/13. Vero Beach Ham/Computerfest.
Late OCT/early NOV. Second SOUTHNET Packetfest, Atlanta area. Sponsored by GRAPES. Contact WB2CPV.
NOV 30/DEC 1. Broward Hamfest. Contact K4GFG.
FEB 8/9, 86. Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park. Contact WD4JKM.
MAR 86 Orlando Hamcation.

BROWARD 'PACNIC'

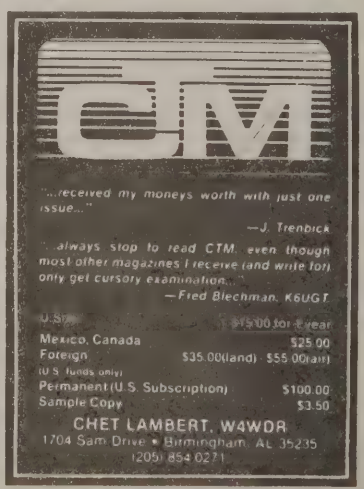
Tom Kneisel, K4GFG

A 'PAC'nic for south Florida packeteers will be held on August 24 beginning at 11 AM at CB Smith Park in western Broward County. All packeteers in South Florida are welcome, so come to meet your packet friends and enjoy the afternoon. Bring your own food; grills and charcoal will be provided. Park admission is $1. There are plenty of activities for the kids at CB Smith Park, which is located on Flamingo Road just north of Hollywood Boulevard. If you are coming from out of the area, exit the turnpike at Hollywood Boulevard and go 12 miles west. Talk in will be on the 145.27 repeater. Sponsored by the Broward Chapter of FADCA and the Racal Milgo Amateur Radio Club. Contact WB4EHG or K4GFG.

NAPLES DIGIPEATER

Tom Kneisel K4GFG

A digipeater has been installed in Naples under the callsign WA1JOU-2. The equipment is a TAPR TNC, IC-22, 60 watt RF amplifier, and 11 element Cushcraft yagi at 115 feet. The yagi is pointed East towards Ft. Lauderdale. Here at K4GFG the reception is 95% or better from late evening through late morning. Afternoon and early evening atmospheric conditions in the Everglades cause a drop in signal, but at other times the link to K4GFG is relatively solid. Stations from Stuart to Miami have heard or worked the digipeater, and WA4WHD-1 in Hollywood reaches Naples fairly well (although it can't hear WA1JOU-2 due to receiver problems). Further improvements in receive sensitivity and power ouput for the Naples digipeater are planned. WA1JOU and the Racal Milgo ARC provided the equipment for this digipeater, and W2CXX the site (via NK4K's efforts). This proves that SOUTHNET can be extended into an area where there is no local packet activity by the efforts of dedicated packeteers. Now that we have come half-way to St. Pete with our packet railway, we challenge those on the West coast to install a digipeater in the Ft. Myers area so that the Golden Packet may be driven in the southern route from Miami to Tampa.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Code: Morse (CW includes Kana), Baudot (RTTY), ASCII (RTTY), JIS (RTTY), ARQ/FEC (AMTOR).
Characters: Alphabet, Figures, Symbols, Special Characters, Kana.
Built-in Monitor: 5" high resolution, delayed persistence green monitor — provides sharp clear image with no jiggle or jitter even under fluorescent lighting. Also has a provision for composite video signal output.
Time Clock: Displays Month, Date, Hour and Minute on the screen.
Time/Transmission/Receiving Feature: The built-in timer enables completely automatic TX/RX without operator's attendance.
Selcal (Selective Calling) System: With this feature, the unit only receives messages following a preset code. Built-in Demodulator for
High Performance: Newly designed high speed RTTY demodulator has receiving capability of as fast as 300 Baud. Three-step shifts select either 170Hz, 425Hz or 850Hz shift with manual fine tune control of space channel for odd shifts. HIGH (Mark Frequency 2125Hz)/LOW (Mark Frequency 1275Hz) tone pair select. Mark only or Space only copy capability for selective fading. ARQ/FEC features incorpora
Crystal Controlled AFSK Modulator: A transceiver witho function can transmit in RTTY mode by utilizing the high st crystal-controlled modulator controlled by the computer.
Photocoupler CW, FSK Keyer built-in: Very high vo current photocoupler keyer is provided for CW, FSK
Convenient ASCII Key Arrangement: The keybo arrangement with function keys. Automatic inser makes operation a breeze.
Battery Back-up Memory: Data in the batte covering 72 characters x 7 channels and 24 retained even when the external power so be recalled from a keyboard instructio can be read out continuously. You car while receiving.
Large Capacity Display Memo Screen Format contains 40 cha
Screen Display Type-Ahea
Buffer Memory: A 160-c buffer memory is displa the lower part of the sc The characters move erasing one by one they are transmi can be written state for tra back-up m
Functi funct spe
P m- ion of
W id Receiving: Mors can be set from

the keyboard at any rate betwe AUTOTRACK on receive. F Codes, rate is variable by when using RTTY Mode level. The variable spe business and comm
Pre-load Functio from the keybo messages can
"RUB-OU messages the info
Auto eve

and TTL ...ar,

...ages written The stored

...while writing ...also be erased while

...F automatically sent

...an be transmitted by word ...e buffer memory with key-

...ers can be transmitted by line ...ry.

...peration: In receive mode, WORD- ...ne last word of the line from splitting in ...asily read.

...ith a keyboard instruction, received data can ...ne same time. This function enables a cassette ...sed as a back-up memory, and a system can be ...lex which uses paper tape.

...A Function: Full cursor control (up/down, left/right) is ...n the keyboard. Test Message Function: "RY" and ...messages can be repeated with this function.

...AND-BREAK (SPACE-AND-BREAK) System: Either ...r space tone can be used to copy RTTY.

...able CW weights: For CW transmission, weights (ratio of dot to ...sh) can be changed within the limits of 1:3-1:7.

Audio Monitor Circuit: A built-in audio monitor circuit with an automatic transmit/receive switch enables checking of the transmitting and receiving state. In receive mode, it is possible to check the output of the mark filter, the space filter and AGC amplifier prior to the filters.

CW Practice Function: The unit reads data from the hand key and displays the characters on the screen. CW keying output circuit works according to the key operation.
CW Random Generator: Output of CW random signal can be used as CW reading practice. **Bargraph LED Meter for Tuning:** Tuning of CW and RTTY is very easy with the bargraph LED meter. In addition, provision has been made for attachment of an oscilloscope to aid tuning.
Built-in AC/DC: Power supply is switchable as required; 100-120 VAC; 220-240 VAC/ 50/60Hz + 13:8VDC.
Color: Light grey with dark grey trim — matches most current transceivers. **Dimensions:** 363(W) x 121(H) x 351(D) mm: Terminal Unit.
Warranty: One Year Limited

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THE JUNKBOX

FADCA has over sixty 8530-A SCC chips. These ICs are used on the FADboard with the Xerox 820 to give a dual HDLC output. These high speed 6 MHz parts are hard to find, and nowhere else will you get them for $20.00 postpaid. Order from FADCA at the address on the back cover.

FADCA has another shipment of Beehive B-152 terminals. These terminals are guaranteed to work when you get them (but keeping them working is your problem, HI). RS-232 port and auxiliary port, 80 x 24 display, many function keys, etc. Terminals receive upper and lower case, but may only transmit upper case unless modified. Documentation is available. $75.00. Write FADCA at published address.

FADCA has several surplus FAA VHF transmitters that may be suitable for digipeater amplifiers. They are rated at 50 watts output, but use tubes (two 4X150s) capable of much higher power in packet service. They are HEAVY. Contact Jim Eberwine, W4APV. 8118-37th Avenue North, St. Petersburg, FL 33710 (H) (813) 347-0942, (W) (813) 539-3543.

FADCA has a modem kit which provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. It was fully described in the March BEACON. The price is $8.95 postpaid. Each order will include a finished (drilled & plated) PC board, parts placement diagram, parts list for both the 300 baud and 1200 baud versions, schematic, and a tune up procedure. If you are interested, send $8.95 per board in check or money order to the designer and producer:

Jerry Quimby (N4AJH)
601 Verbenia Drive
Satellite Beach, FL 32937

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM. NCS: K4NTA

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 8:30 PM EDT. NCS: KF4EF

BREVARD COUNTY AREA: 147.060 (+600) Sunday 8 PM. NCS: N2WX

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

Florida Statewide Frequencies

LAN and calling freq: 145.010

Local QSOs & file xfers: 145.030 /050 /070 /090

220 LANs (20 KHz bandwidth): 221.720, 221.780

Narrow bandwidth linking: 221.400 (20 KHz b/w)

Medium bandwidth linking : 220.570 (100 KHz b/w)

TNC 2 AND FADpad COMMANDS, rel. 0.0.20

NOTE - when "Same as kit" appears, the operation is the same for TNC 2/FADpad as for the TAPR TNC 1

COMMAND	ARG	DEFAULT	VALID RANGE/DESCRIPTION
8bitconv	Y|N	N	When YES, permits the 8th bit in CONVERSE mode to pass between the user and the TNC.
AUtolf	Y|N	N	Same as kit.
Ax2512v2	Y|N	N	When off, valid C bits are forced to 0 and all connections are pre version 2.0 AX.25 lev 2. When on, connections with other v2 compatible TNCs are attempted and allowed, but the TNC reverts to pre version 2 if QSO is with an older TNC.
AWlen	7|8	7	Same as kit. Applies only after cold start/ reset.
AXDelay	n	0	0<=n<=180 x 10ms.
AXHang	n	0	0<=n<=20 x 100ms.
Beacon	E|A n	E 0	0<=n<=250 x 10sec.
BKondel	Y/N	Y	Same as kit.
BText	ss	""	1<=strlen(ss)<=120.
BUdlist	Y|N	N	When Yes, the LCALLS listed are termed buddies and any frames originated by stations other than those in the list are IGNORED in monitor mode. When No, the LCALLS listed are ignored in monitor mode (the reverse of above).
CANline	0-7FH	^x(18h)	Same as kit.
CANpac	0-7FH	^Y(19h)	Same as kit.
COMmand	0-7FH	^c(03h)	Same as kit.
Connect	call/via	N/A	Same as kit, but no trailing TRANS or CONV allowed.
CHeck	0-250x10S	300sec	T3 or WormTIME, if v=2 or v<2 connection respectively.
CMdtime	0-250x1S	10sec	Same as kit.
CMSg	Y/N	N	When on, the specified by the CText command is packetized and sent upon establishment of a connection.
CPactime	Y/N	N	Same as kit.
CR	Y/N	Y	Same as kit.
CText	string	blank	Message sent to people connecting (e.g. I'm in jail, call next week) depending on the setting of CMSG.
CALibr			Enter calibrate mode. Valid commands in calibrate mode are: K-toggle PTT, Q-quit CAL mode, D-dotting, space bar - key toggles hi/ low state on the NRZ>NRZI encoder.
CALSet	0-65535	(UNKNWN)	Count setting for comparison while in CAL routine. CALSET = (1+(525000/Fd))
CONOk	Y/N	Y	Same as kit.
CONMode	T/C	C	Same as kit.
CONStamp	Y/N	N	When on, the daytime stamp is printed with all *** CONNECT messages.
CONVerse			Same as kit.
DAytime	yymmddhhmm		If parameter is present, the software clock/ calender is started for MHeard logging and CONS/Mstamp functions. If it is not present, the daytime is displayed in a form depending on the setting of the DAYUSA flag (see below).
DAYUsa	Y/N	Y	When on, the daytime stamp is displayed in the form common in the U.S. When off, the daytime stamp is displayed in the European form (eg: cmd:DAYUSA OFF DAYUSA was ON cmd:DAYTIME 23-02-85 11:05:30 cmd:DAYUSA ON DAYUSA was ON cmd:DA 02/23/85 11:05:30)
DELete	Y/N	N	Same as kit.
DIGipeat	Y/N	Y	Same as kit.
Disconne			Same as kit.
DISPlay	[A|C|I|L|M|T|]		Same as kit EXCEPT Async replaces the Terminal class, Timing mimics TIming class. NOTE: BUdlist and LCAlls settings are NOT displayed.
DWait	0-31x10mS	160ms	Same as kit, except DWait is ignored when there are outgoing digipeat frames pending.
Echo	Y/N	Y	Same as kit.
EScape	Y|N	N	Same as kit.
Flow	Y/N	Y	Same as kit.
FRack	1-15x1S	3	Same as kit.
FUlldup	Y/N	N	Same as kit.
HCustom	Y|N	N	When ON,LCALLS-BUDLIST used for all functions. When OFF, only filters for monitor function. NOTE: not in beta/dist versions.

Continued on next page.

TNC 2 and FADpad commands, release 0.0.20 Continued

HEaderln	Y|N	N	When ON, a newline is placed between the of a monitored header and the information.
Hid	Y|N	N	When ON, enables the HDLC id frame which is formed at the correct times if the TNC is being used as a digipeater. When OFF, prevents ANY HDLC ID INCLUDING a forced ID cmd.
ID	n/a		The ID command may be issued to force a final identification, used for example when taking a digipeater off the air.
LCAlls	c[,c,...]	blank	c must be a valid call/SSID pair and there may be up to 8 addresses.
LCok	Y|N	Y	Same as kit.
LFadd	Y/N	N	Same as kit.
MAll	Y/N	Y	Same as kit.
Monitor	Y/N	Y	Same as kit.
MCon	Y/N	Y	Same as kit.
MCOM	Y/N	Y	Enables monitoring of <C>onnect, <D>isc, <UA> and <DM> frames.
MHeard			Displays heard log.
MHClear			Clears the heard log.
MFilter	n[,n..]	<empty>	Chars filtered from monitored output 0<=n<=7FH.
MRpt	Y/N	Y	When enabled, displays the path selected and traversed (eg. WB9FLW>AD7I,K9NG*,N2WX-7*, WA7GXD,NK6K,WB6YMH:HI PAUL vs. WB9FLW>AD7I: HI PAUL).
MStamp	Y/N	N	When on, monitored frames are "stamped" with the current daytime (if set).
MYcall	callsign	NOCALL-0	Same as kit.
MAXframe	1-7	4	Same as kit .
NUcr	Y/N	N	Same as kit.
NULf	Y/N	N	Same as kit.
NULLs	0-30	0	True NULLS are sent out. Timing is not performed. Otherwise, same as kit.
Paclen	n	128	0<=n<=255. n==0 interperted as 256. Otherwise, same as kit.
PACTime	E|A n	After 0	0<=n<=250 * 100ms, otherwise same as kit.
PARity	n	Even	0<=n<=3.

n	parity
x 0	no parity
0 1	odd parity
1 1	even parity

PASs	0-7fh	^v(16h)	Same -- NOTE diff default than kit.
PASSAll	Y/N	N	When ON, the reciever does not check for correct CRC on rcvd frames. (NOTE: MHeard logging is disabled when PASSAll is ON)
REDispla	0-7fh	^r(12h)	Same as kit.
REtry	0-15	10	Same as kit.
RESET			Resets TNC and loads default settings. Power down to reset using BBRAMed settings.
RESptime	0-250x100Ms	1.2sec	This is the setting used for T2. (NOTE- T2 is used in both AX25L2V2 and !V2 connections).
Screenl	0-255	0	Same as kit.
SEndpac	0-7FH	0DH	Same as kit.
STArt	0-7FH	11H	Same as kit.
STOp	"	13H	Same as kit.
Trans			Same as kit.
TRACe	Y/N	N	Dump of received frames only. (NOTE: min abbr changed from <0.0.7)
TRFlow	Y/N	N	When ON, software flow (using START and STOP) is used for transparent connections.
TXdelay	n	30	0<=n<=64 x 10ms.
TXFlow	Y/N	N	Same as kit.
Unproto	string	blank	Same as kit.
Xflow	Y/N	Y	Same as kit.
XMitok	Y/N	Y	Same as kit.
XOff	0-7FH	13H	Same as kit.
XON	"	11H	Same as kit .

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
(305) 723-8659

Greetings, XEROX users

I have obtained a copy of the XEROX 820 service manual, and will provide photocopies of the 100+ page manual for $3.50 ppd.

.

73 Dave N7BHC

Dave Pederson
4382 Cherryview Dr.
West Valley City, UT 84120

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NETWORKING

Jack Brindle, WA4FIB

This month we begin our discussion of the individual OSI (Open Systems Interconnection model) layers. Remember that each layer of the model performs a specific task, communicating data and status to the layers immediately adjoining it. The lowest layer is the physical layer. The task of transferring data from one station to another is accomplished here. In wire-line systems this is done through the use of cable and line drivers/receivers. The RS-232 standard was developed to allow interfacing of equipment at this level. This standard specifies the voltage and impedance levels necessary to effectively transfer data between two devices adhering to the specification. This is not the only specification that is in use for wire-line transfer. A look at the specifications made by the various industry standards groups reveals a multitude of standards, such as RS-422/423, RS-339, V.25 and many others. Each standard is designed to accomplish a specific task to communicate between data devices.

The desire to communicate data over the telephone system brought about another standards problem, this time settled in the US by AT&T and in Europe by the CCITT (Consultative Committee for International Telephone & Telegraph). AT&T issued specifications for synchronous and asynchronous modems at various data rates. The best known is the Bell 103 standard that allows full duplex asynchronous communications over a standard telephone connection at 300 bauds. This standard sets forth the audio frequencies that represent a "one" and "zero" for devices on each end of the connection. Computer users are not content to communicate at 300 bauds, so modems using other Bell standards are commonly used for communications at rates from 110 bauds up to 1.54 megabauds and beyond. Of course, the higher rates require special lines to accommodate the stringent noise and bandwidth requirements of these transfer rates. The higher speed modems use synchronous communications methods that allow the modems to synchronize to the bit stream. Because of their bandwidth requirements they usually transfer only one direction at a time, with each end turning control over to the other end when they have completed a transmission.

The lowest speed commonly used synchronous modem is the 1200 baud Bell 202. This modem, once state-of-the-art, has now been replaced in most commercial installations with higher speed devices. It was the availability of surplus Bell 202 modems that spurred the early packet pioneers. These amateurs saw an opportunity in these "cheap" devices to allow their computers to communicate through the radio. As a result, the use of Bell 202 modulation tones has become a "defacto" standard in amateur packet radio systems.

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Several other standards have evolved over the past few years in packet radio. Along with the Bell 202 tones, the use of a frequency modulated (FM) radio operating in the two meter band, usually on 145.010 has been widely adopted. Other standards include 200 Hz shift on HF using the Bell 103 Originate frequencies (or 170 Hz RTTY tones) and FSK modulation. Another approach was used in the original Ft. Lauderdale (FLAPR) system, differential phase shift keying (DPSK) on a 444 MHz FM radio. This modulation scheme is also in experimental use on the OSCAR 10 satellite.

Each modulation scheme has its own advantages and disadvantages. For example, DPSK provides excellent transfer characteristics, but requires the modification of the radio to directly modulate the transmitter and pull the received signal straight from the radio's discriminator. Early packeteers wanted to use unmodified two meter radios to allow those less technically minded to use the new communications media with little fuss. They placed the requirement that packet audio had to come straight from the receiver's headphone or speaker connector and data was to be injected into the microphome jack. This required the use of audio tones to accomplish the modulation. The now-surplus Bell 202 modems thus became a "natural" to perform the task of translating the bit voltage levels into audio tones for the transfer.

A new standard is now emerging in packet radio for high speed data transfer. This standard centers on the K9NG 9600 baud modem design. These modems use a pseudo-random bit sequence to "scramble" data bits so that they provide a non-constant level to the transmitter. The bit sequence is decoded at the receiving modem so that the data can be usscrambled and placed back in its proper order. These modems will be used with 220 MHz transceivers to provide a high speed data network. Upgrades to that modem and/or future designs will allow even faster data transfer. Of course these modems do not work with ordinary unmodified radios.

The various modulation schemes all have one common purpose for their existence. That purpose is to transfer data from one data device to another. The physical layer is concerned with this transfer, but it does not have the ability to accomplish error free transfers. Simply stated, the physical layer attempts to transfer data from one device to another. The equipment used to transfer the data is not concerned with whether the data is transferred properly, it simply just sends the data and decodes what it hears. The layers above must determine whether the physical layer has given them data that is useful. To illustrate this fact, think of the physical layer as a leaky pipe carrying water, but also spilling some. The upper layers are used to patch the pipe so that the water is delivered to its destination.

Continued >>>

The first layer above the physical layer provides the error detection and correction service on a node to node basis. This layer, the data link layer, provides station addressing, error detection, and digipeating facilities in the amateur packet radio enviroment. Discussion of that layer will be the topic of next month's column.

FADCA SQUELCH TALES

Keith O'Brien, N4ZQ

Last month we left off with the review of the Kantronics Communicator. Due to the Beacon deadline, some very interesting infomation about the KPC came to light too late to make the issue. First, Kantronics has recalled all early versions of the TNC for a hardware and software modification. The hardware rework stems from a TNC generated "Birdie" that falls on or about 145.01 MHz. Bad news, as that frequency seems to be becoming the national packet frequency. Don, KB4LLO, one of the reviewers, complained that the signal was very severe, and could not be squelched out. The KPC in test at my location produced no noticable interference at all! Could be that lead dress and TNC location had a lot to do with it. In any case, the complaints were enough for a recall to be issued. Nice to know that the complaints did not fall on deaf ears.

Say you just took delievry of a KPC and wonder if you got the latest issue? Kantronics reports that if the serial number is 49102 or higher, it has been reworked. If you ordered when the KPC was first introduced, and did not send in the registration card or receive the callback letter, I recommend you contact them to arrange for the rework. Word has it that not only do you get the hardware upgrade, but the software is updated too. The review units ran the orginal 1.0 software, but a 1.4 version is out. The new version includes the commands FULLDUP for compatibility with some TNC terminal software (but full duplex operation is not supported), MODEMNA for use of the 1200 baud dumb modem capability, PFINH to inhibit the Poll/Final bit usage, and FILTER to remove control characters from monitored packets.

At the Atlanta Hamfest we had the chance to speak with Travis Brann from Kantronics, and see the new KPC in operation. One of the most visible mods to the TNC was the inclusion of a toroidal core to the wall transformer power lead. Internally a number of ferrite beads have been installed on the I/O leads.

One of the biggest pieces of news to come forth from the Georgia fest was the price reduction of the KPC. Introduced only a few months ago at $389.95, the suggested retail price is now $219.00. Good news if you have been thinking of ordering one, bad news if you were one of the early buyers. Kantronoics claims that the price change was brought about by "competitive factors". I guess that means TAPR's TNC-2 $185.00 announcement at Dayton. The decision was made to lower the price the Monday before the Atlanta Hamfest, and all their dealers were notified the next day. The word really spread like wildfire at the show. All dealers we checked with had sold out by midday Saturday. Saw many a person carrying the KPC box around the show, and the going rate was $185.00. Look for a new bunch of packet people to be getting on soon. But where does that leave the folks that bought in good faith at the original price? Good question! Don't quote me on this, but I was assured that you would be looked after. This could be a free software upgrade to TNC-2 level, when it becomes available. All I will say for now is to hang on to your original sales slip.

AEA was also at the hamfest, and they had news on what they are working on for the packet world. It is a plug-in TNC board for the Commodore C64. It will probably come complete with a built in terminal program and run just above the $200.00 level. Look for more information elsewhere in this BEACON.

Continued on next page.

Write Only Memory Continued

For the GLB digipeaters, it is a simple matter to reprogram the EPROM to a new call. I understand that the lastest version of the software permits the remote programming of the Beacon Text.

Again the target date is August 15th for change over to city name. These names should follow the SOUTHNET maps and be three letters. FADCA had been given the coordination responsibility for digipeaters by the Florida Repeater Council. If there is any questions about which digipeater in a particular LAN will have use of a city name, please contact me. The rule of thumb is that it should be an dedicated digipeater that provides complete coverage to the LAN plus has connectivity to the adjacent LANs.

WORLI MailBox

At the present time, WA3QFN - Clearwater, N2WX-1 - Palm Bay, K4NTA - Stuart, NK4K - Miami and K4TKU - Miami are running WORLI MailBoxes in Florida. Elsewhere in this issue you will find the commands so I will not go into them here. Hank, WORLI, really has done a great job on this software. It has automatic fowarding of messages from one MailBox to another. For example if KI4T in Miami left a message for W1BEL in Brandon on the NK4K Miami MailBox, the fowarding would go like this: The NK4K Mailbox would check and deturmine that anything going to W1BEL should be fowarded to K4NTA in Stuart and send it to K4NTA. K4NTA MailBox would send it on to N2WX-1 and N2WX-1 sends it on to WA3QFN which is W1BEL's home MailBox. The system operators of each MailBox must maintain a foward file with instructions on how to foward for everyone.

Almost any BBS can emulate the WORLI MailBox fowarding. If you want the details of how to do it, let me know in a message on one of the MailBoxes.

Continued from previous page.

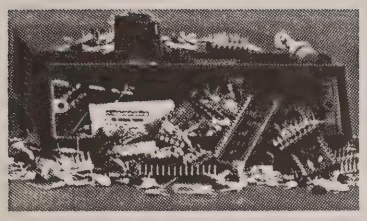
Just a few notes on the Atlanta show in general. The World Congress Center, where the hamfest was located, is just a magnificent facility. The Omni Center, across the street, is an architect's delight. Worth the trip, just to take in these two structures. However, the attendance seemed to be down a bit from the last time we were up there a few years ago. The wife and family really enjoyed the last show where they had a complete program for them, but felt they had been forgotten this time around. The orginal trip was memorable in the fact that I left them off to take in the bus tour of the area, or let the kids run loose in their activity room, while I got down to the serious fleamarket shopping. We could always meet in the hospitality room, of which there was none this time. Think the Atlanta group did a good job, but could use some improvements for the non-amateurs that attend.

An increase in the job work load prevented me from getting to do a column last month. It was all I could do get the KPC review finished. So we didn't get the chance to comment on the Gainesville Packetfest. Judging from the changes we have seen come across the screen, since that get-together, it had to have been a success. Considering this is the season for vacations, and the summer time blues, the Packetfest was a real shot in the arm to get things moving.

In the last few weeks, we have seen no less then three real WORLI BBS and one clone come up on 145.01. What a boost for the Tampa LAN, as Neil (WA3QFN) put the first BBS on line for this side of the state. Was it needed? Download the user log and see for yourself. In only a few weeks of operation, it's gotten quite a work out. The auto fowarding to other RLI type boards is just super. We now have the means of messageing across the state, without having to go thru 4 or 5 digis. Also we are on the verge of total automatic handleing of NTS messages. In fact Gil, W4LLA in the Stuart LAN, checks K4NTA's BBS daily for any outgoing traffic to foward into the national traffic system. None of the FADCA BBS support the HF gateway operation at this time. This would be one more feature to add to a few of them. This would complete the link to the other active packet areas of the country. We could be in closer contact with our SOUTHNET neighbors in Atlanta, with the inclusion of a gateway. That is till we get the SOUTHNET linking together. To date we have been in contact with 11 RLI type BBSs from coast to coast on 20 meters. It really is neat to drop into other parts of the country and see what is going on. The subject of HF Packet is one that we will address in detail in a future column. That's it for this mouth. There is much more worthy to report but we need to get ready for vacation. A trip to Long Island is in the making, and of course packet will be along. Will comment on the activity from the Northeast next time.

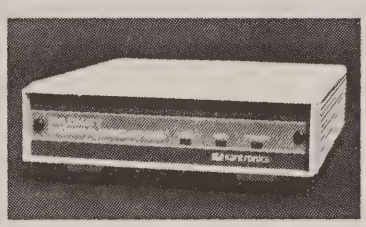
$49... Keith

THE CHOICE IS YOURS



Available: August (?)

- Unassembled Kit
- No Warranty
- Service Assistance (?)



Available: April, 1985
Dayton

Price: NOW $219.00

- Fully Assembled Unit
- Full One-Year Warranty
- Complete Service Facility & Staff

BUT LOOK BEFORE YOU LEAP

Both units are Packet Radio Terminal Node controllers with AX.25 protocol, a standard RS-232 compatible port, and command format software. But many differences exist too.

Buying the Kantronics Packet Communicator makes sense. You know our reputation for quality products and after-sales-support. You know the Kantronics tradition of making computer interfaces and software that work. So take your pick, the unassembled kit with no warranty, or the guaranteed Kantronics Packet Communicator, ready to work in your shack.

With a price of $219 we think the Kantronics Packet Communicator is more than a bargain, it's the smartest buy you'll make this year.

Kantronics

1202 E. 23rd Street (913) 842-7745
Lawrence, Kansas 66046

XEROX 820 NEWS

BRINGING UP THE STOCK 820 AS A MAILBOX

This month I decided to work on bringing up another Xerox 820 board from scratch. I purchased two more 820s for $59 that included everything except the 1771 and the ROMS. (Available from the Arnold Co. 214 Hill Ln, Red Oak, Texas 75154 214-576-2291.) Since I had these parts left over from the Emerald double density conversion it was a good deal for me.

The first problem that I needed to address was the problem of interfacing my Seimens 8 inch drives to the stock 820. If you are a regular reader of these columns in the BEACON then you will remember that in my article on the Emerald conversion I stated that I could not get the step time fast enough for the Seimens drives. Well....I found out that I was patching the wrong location. That is why 6mS worked after I got the Emerald up and running. So here is what you have to do to change the step time on the stock 820. After you apply power you will be greeted with the boot or typewriter options. Type MFF67 [cr] this will be greeted by FF67 02. You type 00 [cr] and this will change memory location FF67H to 00. The 02 is the value that gets written to the 1771 seek time register. The 02 means 10 mS. A 00 or 01 written to the seek time register will produce 6 mS step rates. Then you would type A to boot from disk A. The Seimens drives work very well after this simple patch is made. For a more permanent fix the monitor rom should be patched so that at power up when all the code is moved to high memory this location will be initialized properly.

The primary objective of all this was to get a WORLI type mailbox operational on an experimental basis here in the Clearwater/Tampa area. As many of you already know this objective was reached and the mailbox is up and running. Over the Fourth of July weekend both Ted (K4NTA) and myself got WORLI mailboxes working. We did not know at the time that each of us was working on them and we were both pleasantly surprised to be greeted by the "Hello, welcome to the XXX mailbox" when we connected to each other. Within a few days we had the mailboxes talking to each other. As of this date, Howie (N2WX) also has a new WORLI mailbox up and running and the autoforwards are set up so that they all talk to each other and to the existing Miami mailboxes. We have it set up like this. A message to Miami placed on my mailbox would be autoforwarded to N2WX-1 in Melbourne at 47 minutes past the hour between 10 PM and 7 AM. The message would then be forwarded at 30 minutes past the hour to K4NTA. Then at 13 minutes past the hour the K4NTA mailbox will pass all of its Miami/ Ft. Lauderdale messages to either K4TKU or NK4K in Miami.

This mailbox software could also be used by any packet operator for individual mailbox functions. The software can be configured so that any messages left on your mailbox will be automatically forwarded to the local LAN mailbox and only the messages for you will remain. It could also be real handy to leave a message for somebody when they check in or a disk file can also be left for somebody to download at their convenience. In fact some of the articles in this BEACON were left as messages for the editor to download at his convenience.

The mailbox also has a special message category for formal NTS style traffic. As you have probably noticed this autoforwarding is an excellent way to forward formal message traffic to those individuals with the necessary local or regional contacts to pass the traffic on. I'm sure that traditional methods of traffic handling are going to be joined very quickly by the packet store and forward systems.

If you would be interested in this software I'm sure any of the mailbox operators mentioned above would be glad to share a copy with you. Just leave a message for them on their mailbox to arrange the details! [ed note: See the SOUTHNET Coordinating Committee proposal on software distribution elsewhere in this issue.]

DRNET

C2976 CC10 J. Gordon Beattie Jr. (N2DSY,2990) 6/23/85 4:21 AM
KEYS:/ADDRESSING FORMAT FOR PBBS'S AND QSO'S/

I haven't gotten any response to the last comment I made in this conference. This is an important issue and warrants an exchange of ideas. I am concerned that the new addressing system used in the WORLI style PBBS's will again have table maintenence problems as the network grows. We abandoned direct user addressing because every PBBS had to know where to forward messages for every user in the network. The day will come when there will be too many PBBS's and we will need a better method of determining the path.

I suggested the format "W1XXX @ WORLI/03100603" as a means of solving the problem once and for all. The numeric field after "WORLI/" follows the proposed AX.121. The first digit signifies the network (0= Amateur, 1=Public Data Network, 8=Public Telex Network, 9=Public Telephone Network). The next four digits are the CCITT X.121 defined Data Network Identification Code for the United States (the fourth digit is "0" because it is the default network). The next three digit field is the "Area Code" for Massachusetts where WORLI is located. More digits could be provided if exchanges or regions within the Area Code were used to refine the address. A complete 10 digit code including Area Code, Exchange, and Subscriber could be provided if desired. This would allow a PBBS operator such as WORLI to have a packet access and a voice access number that could be remotely accessed via packet. For example: N2DSY in New Jersey tries to connect via packet to WORLI. N2DSY uses the address "03100603XXXNNNN" and gets a busy. So N2DSY tries to connect to WORLI's telephone port via packet. It would go as follows: N2DSY calls WORLI at address "93100603XXXNNNN". The network in WORLI's local area routes the call out to the telephone network using a gateway. Now we have bypassed the busy packet port and have been connected to the telephone port of the WORLI PBBS via a local telephone network gateway. If WORLI was accessible via Telenet the address would be "13110603ZZZZZZZZ" A gateway to Telenet would provide the needed connection and the traffic could be passed.

The point of all this is to show that we can benefit by using an easily determined address format. This kind of system would allow amateurs to provide the needed communications facilities in times of emergency. The same addressing would be used in message traffic and real-time QSO's.

Your comments please.

NON - ELECTRONIC MAIL

KANTRONICS
1202 E. 23rd Street (913)842-7745
Lawrence, Kansas 66044

7-1-85

To: Packet Clubs
Re: Kantronics Packet Communicator Price Change

Dear Club Members,

Kantronics has made a recent announcement concerning the Kantronics Packet Communicator. We ask your assistance in informing other amateurs who are interested in joining the packet revolution.

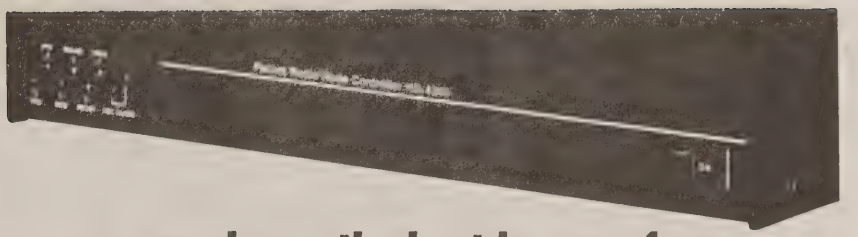
First, Kantronics has dropped the suggested retail price of the Packet communicator to $219.00. This is not a kit price, but rather a fully assembled and tested unit with a power supply and full one year warranty. This price change is effective immediately.

Second, this price change was brought about by competitive factors. Kantronics does not plan to discontinue the Packet Communicator, or make an effort to "dump" an old design before announcing a new unit. We have simply decided to lower the price in an effort to show how serious Kantronics is about packet communication.

Third, Kantronics will continue to guarantee all our products, and give service assistance via phone and letter. We are proud of the service reputation we have, and we plan to do our best to get and keep you on the air.

Please inform those who question the price change of these facts. Kantronics is always available to answer questions about our products and the way we do business.

Sincerely,
/s/
Mike Forsyth
Marketing Director



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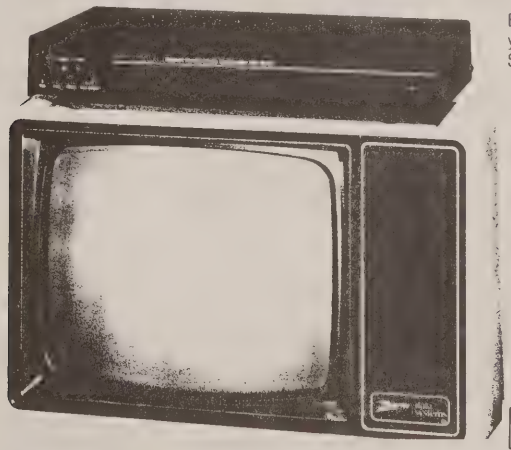
A version of the popular Tucson Amateur Packet Radio (TAPR), the Heath TNC combines computer technology with Amateur Radio to open up the world of packet radio and its countless applications. Just type in your messages on the keyboard of a terminal or computer and the Heath Terminal Node Controller does the rest. It allows you to run your station more efficiently and with more activity and variety of uses than were ever possible before.

With Heath's TNC you can: send messages at speeds up to 1200 baud or higher; extend your station's range by relaying transmissions through up to eight stations; leave a message at a friend's shack; automatically transmit your call letters and a message; converse via satellite; receive computer programs; participate in bulletin boards and more. All error-free, fast and without worries about QRM.

The Heath TNC Kit features built-in quality. It has an integral 1200 baud modem and extended baud rates up to 19,600 using an external modem and optional clock. It also has an automatic beacon, digital repeater, RS-232C serial port, parallel port, and eight operational lights for complete TNC status at a glance. The TNC comes with Heath's well-known and well-illustrated step-by-step assembly manual.



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SOUTHNET Coordinating Committee

SOUTHNET QUESTIONS AND ANSWERS
Gwyn Reedy, W1BEL

WHAT IS THE SOUTHNET COORDINATING COMMITTEE (SCC)?

At the SOUTHNET Packet Conference, members of FADCA, GRAPES and MARDA agreed to establish a committee for coordination of SOUTHNET matters. Since that time Alabama and South Carolina have nominated members. SOUTHNET is envisioned to cover North Carolina, Tennessee, and portions of Louisiana, as well as the states already involved. The exact borders of SOUTHNET are not a matter of great concern since close coordination will be required with neighboring areas in any case.

WHAT WILL THE SCC COORDINATE?

The kickoff meeting discussed the need for standard procedures for establishing linking, including frequency coordination, protocols, etc. There are many areas of user procedures and BBS operation that could benefit from the establishment of recommended procedures.

WHO IS ON THE COMMITTEE?

Alabama-K4HAL and W4HFU
Florida-N4ZQ and W1BEL
Georgia-WB4GQX and WD4LYV
Mississippi-K5OS and WA5DVV
South Carolina-W4FX and WA4SZK

WHAT WILL BE THE FIRST SCC PROJECT?

The old SOUTHNET map published in several previous issues of the BEACON is badly in need of updated information. SCC is going to establish a method for local members to provide regular inputs about stations on the air and digipeaters and BBSs in operation. The callsigns will be compiled for the SOUTHNET callbook. Volunteers are solicited.

****

Ideas for SOUTHNET's Consideration
Wayne Harrell, WD4LYV

After attending the SOUTHNET Packet Conference, I have spent a lot of time thinking of ways to improve SOUTHNET. I am writing some of the ideas here because I believe these ideas deserve our attention before the network gets so large that we can't effectively take care of it.

1. Have someone in charge of WORLI MailBox coordination for all of SOUTHNET. This person would correspond with Hank (WORLI) for SOUTHNET and help take the load off him, so he can concentrate on programming. He would distribute updates to System Operators via a point of contact in each state or region. These points of contact would need to be knowledgeable MailBox operators themselves, and provide advice and assistance to other Sysops in their area.

2. Encourage every LAN to pursue operation on other than 145.01 until the linking function of that frequency is replaced by a 220 link. Early installation of a gateway will make this possible and will serve as part of the 220 linking equipment when that is ready for operation.

3. Get the local MailBox/BBS off of 145.01 as soon as possible. Where network loading is a problem, discourage file transfers during the prime operating hours of 7 to 11 PM. Perhaps the Sysop could operate the MailBox/BBS on a local LAN frequency during those hours, and on 145.01 at other times for forwarding of messages.

4. Encourage the larger LANs to have a direct link with neighboring large LANs to reduce loading on the networking link frequency. This will reduce the loading on 145.01 now and will stave off the overloading of the high-speed network when it is built.

5. I recommend each store and forward system refrain from forwarding during prime hours. Each station should only forward to an easily reached nearby system with no more than 2 digipeaters enroute. Each system would have a forward file for all stations north and south of it, addressed only to the next system in the chain. These network message servers should not be accessed by local users if another local MailBox exists. These systems should not beacon.

6. Encourage all stations with HF packet capability to restrain themselves from tieing up the network servers. We need to establish a frequency for HF packet QSOs separate from the autoforward frequency.

7. Files of interest to all packet users need to be forwarded to all other MailBoxes. That will allow the files to transit the network once and be accessed locally, rather than cross the network for each local access.

8. MailBoxes and BBSs should not beacon through several digipeaters!

9. Is there interest in a large scale group purchase of Xerox 820 equipment? With the number of packeteers in our region, we ought to be able to get some great quantity discounts. Of course someone would have to agreé to collect the money, place the order, and reship the parts...

10. Establish a BBS subcommittee of the SCC to recommend policy and procedures for SOUTHNET.

I am willing to act as clearinghouse for other ideas of the type presented here. Send to Wayne Harrell, WD4LYV, Rt. 1, Box 368, Sycamore, GA 31790. I will compare each submission with the list we have and add any new ones.

PACKET RADIO WITH THE TONO EXL-5000E COMMUNICATIONS TERMINAL
J. W. Gregory, W4QF

A completely stand alone VHF/HF Packet, AMTOR, RTTY and CW terminal is accomplished by combining the Kantronics Packet TNC with the TONO EXL-5000E communications terminal.

1. Wire the RS-232 cable supplied with the Kantronics unit as follows: brown and white wires to individual RCA phono plug tips. Wire black wire and shield together and to the previously wired phono plug shields. The other wires are unused.

2. Connect brown wire phono plug to EXL-5000E "TTL" jack and white wire phono plug to "FSK" jack (on rear panel).

3. Very important: Carefully remove the front panel of the Kantronics unit and move the jumper from "RS232" to "TTL" (see manual).

4. Set all front panel buttons to OFF PsexceptPs push in "TTL-IN" and "ASCII". Turn EXL-5000E on. Set speed to 300.

5. Turn packet TNC on and, following Kantronics manual instructions, hit 'SHIFT *' and packet TNC will identify.

6. Very important: Use "CTRL" and "M" at the same time to generate the "CR" main control signal required by the packet TNC. Do not use the CR/LF (crooked arrow) on the EXL-5000E keyboard as the control.

7. Change Kantronics TNC "ECHO" to "OFF". Follow the instruction manual.

8. All other commands are standard and correct from the keyboard.

9. Follow packet TNC manual instructions for all interconnections, etc.

Thats all there is to it!

****

NOTICE

Please fill out the questionaire with your name and other requested information, fold it so the addresses are positioned for mailing, add 22 cents postage, and mail.

Digital Radio Net (DRNET) is an electronic mail system hosted on the NJ Institute of Technology Electronic Information Exchange System (EIES). DRNET has made possible the timely publication of packet news in the BEACON and the TAPR PSR, and has played a very important role in development of the TNC2 and 9600 linking equipment. Your effort to send in this questionaire can help to keep this system available for the development of packet radio.

****

M 1395 Thomas A. Moulton (W2VY,995) 7/ 9/85 8:31 AM L:25
(ORIG.) 7/ 9/85 8:09 AM L:15
KEYS:/SEND TO ALL PARTS OF THE WORLD/PAPER REPLIES PLEASE/
TO: (Group 95)

****

ATTENTION:

****

In an effort to discover how much of the material from EIES (DRNET) gets copied to BBS and other distribution methods, I am requesting the following information from EVERY STATION WHO READS THIS MESSAGE:

Call, Name, QTH, Packet Gear, Class

How you got This message, how often you get EIES (DRNET) messages

Name of your local packet group, and number of members

****

I would also like to see the final message if you can print it.

Why do I want all this? I would like to flood my mailbox with mail and then take the stack and be able to say, "See these 5000 letters they came from the 30 DRNET accounts!"

I also want to see how well messages get distributed.

My address is:
CCCC @ NJIT
Tom Moulton, W2VY
323 King Blvd
Newark, NJ 07102

****

NAME:_____ CALLSIGN:_____

ADDRESS:_____LICENSE CLASS:_____

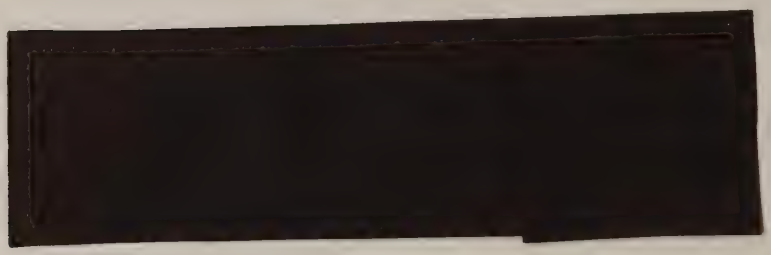
CITY, STATE, ZIP:_____

This message was obtained through DRNET (Acct 2975) and the FADCA>BEACON newsletter. Circulation approximately 500 copies monthly. The BEACON contains a substantial amount of DRNET information every month.

OTHER PACKET GROUPS I ALSO BELONG TO:_____

22¢

FADCA, Inc.
812 Childers Loop
Brandon, FL 33511



CANDIDATES FOR FADCA DIRECTORSHIP

Kenneth Block, WD4KSO

If elected as a Board Member I shall continue my support of FADCA with vigor and enthusiasm in any role the officers see fit. My background includes administration both in business and amateur radio affairs. I was among those who conceived and facilitated the start of the Palm Beach Amateur Radio Council and served them as a Director and Vice President. I am also a past president of the Palm Beach Repeater Association. Packet Radio is not in its infancy. I would like to help guide its future.

Bill Bosley, K3NN

I feel I can make a real contribution as a FADCA Director by representing the interests and airing the opinions of packeteers in the Panhandle area. I have lots of ham radio experience, having been active continuously since 1954. I have a degree in Electrical Engineering and have experimented extensively with antennas, circuit design and microcomputers and although only a beginner, I have an intense interest in Packet Radio. I am a mid-level manager for an Air Force flying unit which gives me the background to understand and deal with organizational bureaucracy. All this means that I'll be gald to take time out from playing with packet to participate in the nuts and bolts running of FADCA.

Jack Brindle, WA4FIB

First licensed in 1970, I have been active in packet radio since the spring of 1982 when K4GFG and I began work on the Ft. Lauderdale (FLAPR) packet system. I am currently involved in developing packet systems for the Apple Macintosh computer. My background includes degrees in both Electrical Engineering and Computer Science. My work experience has included a short stay in the ARRL Technical Department. I am presently a senior engineer for Paradyne in Largo, in the network systems group. I have been a FADCA member for almost two years, and am currently involved in the high speed linking efforts for network node digital hardware and software design. I believe the future should see FADCA leading the way in packet networking at all levels.

Jim Diggs, K4AHO

I have been involved in digital amateur communications for a long period of time, first RTTY, then AMTOR, and packet. I have been participating in FADCA since it was formed and have been the principal representative of the Orlando area. I helped organize the Central Florida Packet Association which is a local group affiliated with FADCA. I organized the FADCA booth and seminars at the 1985 Orlando Hamcation, both of which were well received. I have donated time and equipment to the Lake Wales digipeater, and authored the JPAC terminal program for the C-64 on packet. I would like to continue to provide leadership to FADCA through the Board of Direrctors position.

Andy DiMartini, KC2FF

I was first licensed in 1965 as WN2VUJ in New Jersey. I was active in the local Civil Defense RACES organization and a regular member of the NJ Traffic Net. I was also active in Army MARS and was trained in RTTY techniques. In College I was an officer of the campus radio club and was active in two meter autostart RTTY, 10 meter FM, SSB DX and Field Day activities. While in the Air Force I helped expand the single FM repeater in Rapid City, SD to a three site network, and obtained my advanced class license. Back in NJ, I put op the first 10 meter repeater in the northern part of the state, a split site setup linked on 450 over a 5 mile path. Was a founding member of the Metroplex ARA. Put up a wide-area two meter voice repeater, cross-linked to the 10 meter repeater and a 450 repeater. This installation was used to contact stations on three continents. The club has grown to over 1000 members today. I have been involved in packet since early 1984 and have built and installed the KC2FF-7 wide-area digipeater in Clearwater. I am currently working on equipment for implementing the GATOR-1 linking scheme. I feel I can be of service to the FADCA Board on technical matters as well as bringing my organizational experience and packet enthusiasm.

Joe DiPietro, WA4NWO

I have been a licensed amateur and professional electronics technician since 1975. My main interest since then has been experimentation on the higher frequencies, incliding the construction of 1300 MHz repeaters and 10 GHz beacons. My involvement in packet radio began in August 1984 at the Jacksonville Hamfest. Since then I have constructed three TNCs and a wide area digipeater, as well as organizing our local packet club. Presently I am an Electrical Engineering student at the University of Florida, and President of both the Gator Amateur Radio Club and the Gainesville Amateur Packet Radio Association. Packet radio is clearly the key to future growth in ham radio. I believe my experience would be a major asset to FADCA and therefore would be willing to serve as a member of the Board of Directors.

Howard Goldstein, N2WX

Growth, public service, and technology. If FADCA is prepared do deal with these issues, the rest will fall into place. As a director I will support, at every board meeting: A stronger voice for packet in the amateur community as a whole. One thing this means is recognition of the need for more spectrum through assignment by coordinating bodies. Frequencies are the tools to ply the packet waters with - and without them, there is no place for growth, no paths for public service acts, and no bandspace to utilize any new technology with. As a person I've devoted almost two years of work to the growth of packet in Florida, and in the country. TAPRs recently announced TNC 2 represents a year of software effort on my part to help build packet activity by providing a TNC with unmatched features at a reasonable price. As your to expend some of these efforts to the benefit of FADCA, and in a much more direct way. Besides experience as a ham (N2WX since 1977, licensed since '76), I'm currently an upperclassman business major at Florida Institute of Technology. Moreover, I bring almost five years of real world small business experience with me. I hope to receive your vote.

Continued on next page

Ted Huf, K4NTA

I have been on packet radio since the Spring of 1983 when I was the TAPR TNC Beta test coordinator for the Stuart, Florida area. In the Summer of 1983 I built Florida's first wide area digipeater, K4NTA-1. and Florida's first Packet Radio BBS system. I was cofounder of FADCA with Gwyn Reedy, W1BEL and currently serve as Vice President of FADCA. I am coordinator of GATOR 1 and the designer of the addressing scheme. From March to July 1984 I was editor of the FADCA>BEACON Newsletter. I am also working with Howie Goldstein, N2WX as a beta tester of the the TNC-2 software. I hold an Advanced class ham license and have been licensed since 1961. I am Director of Engineering for Perry Cable TV Corp a CATV company with systems in St. Lucie, Martin and Plam Beach counties.

Dick Klein, W4PCM

Amateur radio gave me a start in electronics which eventually ended up as degrees in Physics and Electronic Engineering. Now I have a law practice in Jacksonville specializing in business and finance. Since my affiliation with FADCA, I've helped stimulate packet activity in the Jacksonville area, organized packet radio events at the Jacksonville Hamfests, prepared and filed the Articles of Incorporation and By-Laws for FADCA, and serve as a volunteer legal adviser. As director, I plan to continue these type of activities.

Jon Knapp, WD4KSN

My special interests in radio are emergency communications, computers and VHF DX. My most memorable DX two-way contact was W5LFL on STS-8. I was active in the formation of the Palm Beach Amateur Radio Council and look forward to seeing packet radio included in emergency plans. Currently I am operating a business that installs satellite dishes, TV antennas and two-way radios. If elected to the Board, my efforts will be focused in the areas of organization, emergency and public service applications of packet radio.

Gwyn Reedy, W1BEL

I have been licensed since 1954 and hold an extra class license. I became interested in packet radio in early 1981 and obtained my first Vancouver TNC board that year. When I arrived in Florida in late 1982, I organized the Tampa area Beta test site for the TAPR TNC. That small organization and K4NTA's similar group formed the basis for the formation of FADCA in December 1983. I have traveled the State of Florida giving demonstrations and talks about packet radio, and have represented FADCA at numerous national conferences. I have been serving as President of FADCA and editor of the BEACON since their inception, with the kind help of K4NTA when I was out of country for 4 months in 1984. I instigated and helped organize the first SOUTHNET Packetfest and the formation of the SOUTHNET Coordinating Committee. I wish to continue to provide leadership to FADCA and help us grow beyond our present 250 members by providing packet leadership for Florida, the Southeast, and the entire packet radio community.

Bill Sams, KF4LG

A Cub Scout trip in the fourth grade in 1952 started me into the world of amateur radio. I was mainly interested in HF DX before being introduced to packet radio. W1BEL convinced me to join the TAPR Beta test and I have so enjoyed the marriage of computers to radio that my HF station is greatly neglected. I have assisted Gwyn with local demonstrations and have served as interim director through the organizational phase of FADCA> I have an Electrical Engineering degree and am Manager, T and D operations for Tampa Electric Company where I am involved in the construction and maintenance of high voltage transmission lines. I would like to serve FADCA and my fellow packeteers in helping shape and guide the future of our hobby and organization. I believe FADCA will continue to be a major force in the development of packet radio, and that its leadership is important.

Bill Whitaker, WD4JKM

I was first licensed in 1977 and hold a General Class License. I am a Native Floridian, currently serving as Vice President of Dade Radio Club (Miami), and Member of the 1986 Tropical Hamboree (Miami hamfest) Committee. I formerly served as Treasurer of Dade Radio Club (6 consecutive terms), Member of South Florida FM Association, Net Manager of Dade Emergency Net (2 consecutive terms), Member Dade County ARPSC Planning Committee. My exposure to digital communication modes began in 1977 with RTTY and lead to the establishment of a local 2-meter RTTY simplex frequency for use during communication emerencies in the county-wide emergency support plan. I have provided many manhours of volunteer communications work with various community events such as the Orange Bowl Parade/Marathon, March of Dimes Superwalk, and Dade County Youth Fair. I have worked with many Amateur groups promoting packet radio through video tape programs and demonstrations even before becoming active in the mode. This interest was sparked by the efforts of FADCA members who accepted my invitation to the 1984 Tropical Hamboree and started a wildfire of interest in South Florida. Dade Radio Club has emerged as the driving force behind packet activity in South Florida with W4NVU-1 digipeater on line, and funds allocated for GATOR-1 linkng. I look forward to your support as director and toward coming year of advancement of Packet Radio in Florida.

IF YOU ARE A FADCA MEMBER, A PRE-ADDRESSED BALLOT IS INCLUDED IN WITH THIS ISSUE OF THE BEACON. PLEASE MAKE YOUR SELECTION AND RETURN THE BALLOT PROMPTLY. YOU MAY WRITE IN THE NAME OF ANYONE THAT YOU CARE TO VOTE FOR. FADCA BY-LAWS REQUIRE DIRECTORS TO BE RESIDENTS OF FLORIDA.

Ballot

FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION, INC.

Board of Directors

(Vote for eight candidates only.)

Kenneth Block, WD4KSO	___	Ted Huf, K4NTA	___
Bill Bosley, K3NN	___	Dick Klein, W4PCM	___
Jack Brindle, WA4FIB	___	Jon Knapp, WD4KSN	___
Jim Diggs, K4AHO	___	Gwyn Reedy, W1BEL	___
Andy DiMartini, KC2FF	___	Bill Sams, KF4LG	___
Joe DiPietro, WA4NWO	___	Bill Whitaker, WD4JKM	___
Howard Goldstein, N2WX	___	Write-in	_____

Be sure to vote for no more than eight candidates. Fold the ballot on the marked lines and use a staple or tape to secure it. Apply 22 cents postage and mail before August 15, 1985.

Florida Amateur Digital
Communications Association, Inc.
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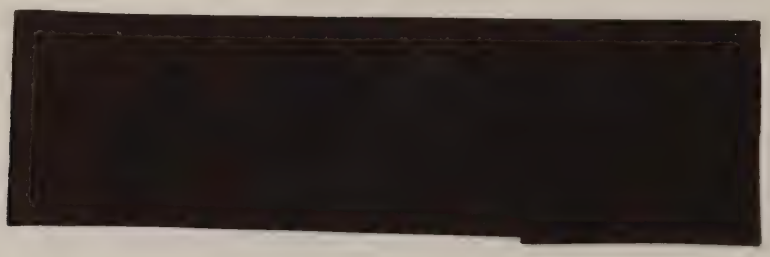
Brandon, FL 33511

224



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FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

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FADCA>BEACON

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...And lots of help from many others. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO	Dave Frey, K3AAX
Ted Huf, K4NTA	Dick Klein, W4PCM
Tom Kneisel, K4GFG	Gwyn Reedy, W1BEL
Bill Sams, KF4LG	Bill Whitaker, WD4JKM

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FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (4 ounces) 8 1/2 by 11 inch envelope to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

Advertising space is available in the FADCA>BEACON according to the following rate schedule. There will be an additional charge of $10.00 for set up of non-camera ready copy.

Full page	$30.00	Discounts for multiple
Half page	$17.00	issue contracts.
Quarter page	$10.00	
Eighth page	$ 6.00	

Small classified advertisements for FADCA members will be without charge.

Rates are based on a guaranteed monthly circulation of 250 copies, however that amount is normally doubled by introductory mailings and distribution at hamfests and demonstrations. BEACON readers are dedicated, enthusiastic experimenters and builders comprising a specialized, trend-setting market.

Copies printed:

January 1985	- 550	May 1985	- 500
February 1985	- 540	June 1985	- 500
March 1985	-1000	July 1985	- 600
April 1985	- 500		

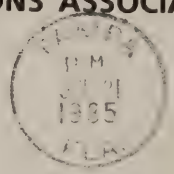
Volume one (1984) back issues of the FADCA>BEACON are available for reproduction and mailing costs of $.75 per issue, or $5.00 for the entire year (11 issues). Send your request to the FADCA address.

Any material appearing in the FADCA>BEACON may be reprinted without further permission if credit is given to the author and the BEACON.

The deadline for inputs for the AUGUST issue of the FADCA > BEACON is AUGUST 10th. Articles should be in final form using a 35 character column width.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Florida Amateur Digital
Communications Association, Inc.
812 Childers Loop
Brandon, FL 33511



FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 8 | Brandon, Florida | August 1985

PACKET RADIO INTER-LAN ADDRESSING METHODS - A COMPARISON-

Joe Mehaffey, K4IHP
6950 Hunters Knoll
Atlanta, GA 30328
(404) 393-9508

BACKGROUND

Packet radio has a number of aspects which must be researched and decided upon early to permit an orderly growth. Each of these areas will have a number of technically and politically acceptable methodologies available. Some of these areas where decisions must be made are:

1. Link Protocol
   (AX.25 leads here)
2. Primary Link Access Freq
   (Two meters leads here)
3. Backbone Link Freq
   (220/440/1290 seem likely but 144/900 possible)
4. Digipeater Hardware
   (Anything goes)
5. Automatic Routing Methods
   (Only a gleam in someone's eye right now)
6. Networking Control Methodology
   (Just beginning to be thought out)
7. Network Station Addressing Plan
   (Needed now so simple routing schemes can be implemented)

In this paper, I will address only

THE NETWORK STATION ADDRESSING PLAN

GOALS

Many options have been offered for an areawide, statewide, or even nationwide plan. Lets review some desireable goals for a Packet Radio Network Station Addressing Plan:

1. It should be unambiguous.
2. It should be simple to use.
3. It should not complicate flexible routing.
4. Reference guides for all addresses should be easily obtainable.
5. It should be useable first statewide, then regionwide, then nationwide, then worldwide without requiring extensive hardware or software reconfiguration for already installed network switching facilities.

These are ambitious goals. Let us keep them in mind as we compare several options.

POSSIBLE ADDRESSING PLANS

A. An obvious first thought is the amateur's own callsign with smart network switches which have his address in a routing table.

ADVANTAGES:

1. Ultimate simplicity for users.
2. Simple support as long as the network is very small.

DISADVANTAGES:

1. Requires smart switches at many nodes.
2. Requires extensive lookup table space for large networks.
3. Data base maintenance for large networks would be a nightmare.
4. Any new station coming on the network would require extensive network update.

B. Another proposed solution is an amateur call plus his area code and the first three digits (exchange) of his phone number, i.e.

Connect K4IHP v 404393

ADVANTAGES:

1. Pretty simple for users.
2. Reasonably short in terms of digit count.
3. Data for numbers is readily available from long distance information for a fee or perhaps from a telephone book.
4. Routing address digits would be pretty well fixed and a new station coming on the network would not require network management.

Continued >>>

A N N O U N C E M E N T ! TAPR TNC 2 NOW AVAILABLE!

Tucson Amateur Packet Radio is pleased to announce the availability of the new TAPR TNC 2. In field testing since January, it is now ready for you!

Effective Monday, August 19th, the TAPR Office will be accepting orders and, for the first week, will have extended hours (9 AM until 9 PM Pacific Daylight Time - 12 NOON until 12 MIDNITE for you Easterners). (These extended hours are possible through the participation of volunteers, some of whom are travelling to Tucson from all over the country to assist you in obtaining a TNC 2.) 280 TNC 2 kits will be ready for shipment on or about August 19th. All parts are in hand (and boxed!) EXCEPT:

a) the manual, which is at the printers and is expected back on the 16th, and

b) the cabinet end plates, which will ship to TAPR on or before the 10th of September. The first units will be shipped WITHOUT the cabinet end plates; the end plates will be sent to TNC 2 owners as soon as TAPR receives them.

The price for TNC 2 is $185 plus $10 S & H. A credit card order incurs a 3% surcharge (that's what the bank charges us) for a total of $200.85. Arizona residents must add tax, of course.

To order your TNC 2 kit, follow these simple rules:

1) Call the TAPR Office at (602) 746-1166

2) Have the following information available
   * Your Name
   * Your UPS shipping address (no PO Boxes, please)
   * A DAYTIME telephone number at which you can be reached
   * Your VISA or MasterCard number and expiration date

3) Two shipping labels (one for the TNC 2, one for the cabinet end plates) will be filled out WHILE YOU ARE ON THE PHONE.

4) Your credit card slip will be made out and read back to you.

5) You will be assigned a sequential order number. Number 101 means you will be shipped the 101st TNC 2 kit.

Due to limited supply and expected large demand, only one kit per person and one kit per call may be ordered.

After Office hours, an automatic answering machine will be connected to the telephone line. IT WILL NOT RECORD MESSAGES! It will, however, advise of the day's order status and shipping status by order number. Thus, in less than a minute, you can find out if your order was shipped, if any orders are still being taken for the following day, and how many TNC 2s are still available. We hope this procedure minimizes any inconvenience to you, and we will do our best to ensure that no orders are misplaced.

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5. Probable that a worldwide extension, such as a prefix, could be found.

DISADVANTAGES:

1. Phone numbers for people change fairly frequently due to moves.
2. Finding an "address" free would involve at least a three step procedure such as:
   a) lookup address in callbook
   b) lookup area code for city
   c) somehow locate a known telephone number located in the desired city.
3. Single published source of address data is not part of the existing 'readily available at your bookstore' information.
4. Would probably require the publication by packeteers of a separate directory to permit ease of use. Such a directory would require periodic maintenance.

C. A third proposal is to use an amateur's callsign plus his airport locator designation and his area code, i.e. Connect K4IHP v ATL404

ADVANTAGES:

1. Pretty simple for users.
2. Reasonably short in terms of digit count.
3. Obviously extendable worldwide.
4. Routing digits would be pretty well fixed and a new station coming on the network would not require periodic maintenance.
5. The area code portion of the address would be reasonably easy to discover at no cost in many areas with a telephone directory area code map.
6. Could probably maintain six digits for worldwide extension even though other countries do not necessarily use area codes like the USA.

DISADVANTAGES:

1. The airport locator portion of the address in most cases is non obvious.
2. The Airport Locator Guide would provide this information, but in many cases an area has several airports and this would require data base information to be stored at local centers.
3. Airort Locator Guides are not available at every book stand--and they are not cheap.
4. The FAA or your local airport would probably get lots of calls from those who 'just had to have' the airport locator ID for the Needles California airport or similar. They probably would not like that.

D. Another interesting possibility is an amateur's callsign plus the first letter of his callsign plus his postal code (ZIP Code in USA), i.e. Connect K4IHP v K30328

ADVANTAGES:

1. Pretty simple for users.
2. Short in digit count.
3. Zip codes change very seldom and the first three digits for an area almost never change.
4. Low network database maintenance as a result of item 3.
5. ZIP Code and Postal Code books are easy to find and cheap (in areas where they are used).
6. The "W" (or K, A, or N) in front of the ZIP Code would designate USA. This also makes it compatible with the TAPR TNC (AX.25) digipeating scheme.
7. Callbooks are also a ready source of ZIP Codes.
8. First two numbers in ZIP Code have good regional correlation and may be enough for initial routing to destination.
9. Hams won't have to maintain directory.

DISADVANTAGES:

1. The format of the address digits will not be constant worldwide because postal codes are not consistent in various countries.
2. Grid Square or other ficticious "ZIP Codes" will be required in localities without official postal codes.
3. Some database maintenance will be required.

E. Another interesting possibility is the ARRL Factional Grid System. With this method an address would consist of the amateur's callsign plus Grid Location Designator, i.e. Connect K4IHP v XYABNP.

ADVANTAGES:

1. Worldwide applicability.
2. Unambiguous location code worldwide.
3. Universal format worldwide.
4. Grid reference algorithm gives direction to desired destination station and may be useful in some primitive routing schemes.
5. Fairly simple for users.
6. Grid structure is fixed and not subject to change.

DISADVANTAGES:

1. Most hams do not have a Grid Map readily available.
2. The ARRl Grid squares have no relationship to political boundaries.
3. No tabular database existsa to translate mailing addresses or cities to Grid addresses.
4. Hams must maintain tabular databases relating Grid addresses to political localities.

EDITORIAL

With the above options in mind, my choice is for the callsign plus ZIP Code option (item D. above). This would offer the simplest, user friendly format with maximum ease of locating the address (Postal Code) data. Most industrialized countries already have in place some form of postal 'ZIP Code' which are published in callbooks and postal publications. Since the industrialized areas are the most likely to have large LANS, this would seem to limit problem areas while minimizing user problems for most of us.

Some have expressed a desire for the grid square apporach because the nature of the grid square system will assist in ease of routing. I believe the statement that the grid square system will substantially assist in data routing on the network is a mistake. It is almost a certainty that the general case network switching center will require a lookup table for routing and route refinement. Consider the following:

1. Grid square can point to the destination.
2. However, on the network it may be necessary (or desirable) to go first North to send data South, North to send data West, or to a satellite to send data East, etc.
3. The telephone companies have been wrestling with this problem in automated switching since the early 1900s. Their network has a much higher connectivity (i.e. the ability to go in any direction from a node) than we will ever have on packet radio. They have moved almost 100% to routing tables for many reasons. Among the most significant to use are:
   a) the most direrct route may not be the best route for a number of reasons,
   b) alternate routes may not involve a direct route, and
   c) network outages are not easily bypassed with algorithmic routers.

In my estimation, the problem of systemwide data addressing and the problem of data routing are two separate and distinct technical problems. While they definately should not be considered in isolation, we should not produce a user unfriendly addressing scheme to facilitate routing. The routing problem is not simple and will not, in the general case, yield to simple algorithmic solutions. The simplest universal solution known is the lookup table, -AND- if properly implemented, the lookup table approach need not be memory intensive.

SUMMARY

Several amateur radio packet WAN (world area network) addressing schemes were discussed. The "ZIP Code" scheme appears to the author to offer the most user friendly approach in-so-far as LAN users are concerned.

It is suggested that WAN addressing and routing are separate but related issues and should be addressed as such.

The author solicits comments and constructive inputs on the twin areas of WAN addressing and WAN routing.

THE JUNKBOX

FADCA has 8530-A SCC chips which are used on the FADboard with the Xerox 820 to give a dual HDLC output. These are high speed 6 MHz parts. Only $20.00 postpaid.

The FADCA modem kit provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. It was fully described in the March BEACON. The price is $8.95 postpaid from the designer and producer:

Jerry Quimby (N4AJH)
601 Verbenia Drive
Satellite Beach, FL 32937

FADCA badges are now available. Badges are 2 1/4" round with locking pin on backside. $1.00 without call letters, $2.00 with. Colors available are yellow, gold, salmon and blue.

For Sale: TAPR TNC1. Includes HF mods from July BEACON and cabinet. $200.00. WB8ZPE. (813) 681-6868.

ALL parts are available for the TAPR/AEA/Heath TNC including bare PC boards, 1935s and 2212s. Contact Bob Boyce, KB4IQM. (305) 967-9999. (24 hours).

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Convenient ASCII Key Arrangement: The keyboard layout is ASCII arrangement with function keys. Automatic insertion of LTR/FIG code makes operation a breeze.
Battery Back-up Memory: Data in the battery back-up memory, covering 72 characters × 4 channels and 24 characters × 8 channels, is retained even when the external power source is removed. Messages can be recalled from a keyboard instruction and some particular channels can be read out continuously. You can write messages into any channel while receiving.
Large Capacity Display Memory: Covers up to 1,280 characters. Screen Format contains 40 characters × 16 lines × 2 pages.
Screen Display Type-Ahead Buffer Memory: A 160-character buffer memory is displayed on the lower part of the screen. The characters move to the left erasing one by one as soon as they are transmitted. Messages can be written during the receiving state for transmission with battery back-up memory or SEND function.
Function Display System: Each function (mode, channel number, speed, etc.) is displayed on the screen.
Printer Interface: Centronics Para Compatible interface enables easy connection of a low-cost dot printer for hard copy.

Wide Range of Transmitting and Receiving: Morse Code transmitting speed can be set from the keyboard at any rate between 5-100 WPM (every word per minute). AUTOTRACK on receive. For communication in Baudot and ASCII Codes, rate is variable by a keyboard instruction between 12-300 Baud when using RTTY Modem and between 12-600 Baud when using TTL level. The variable speed feature makes the unit ideal for amateur, business and commercial use.
Pre-load Function: The buffer memory can store the messages written from the keyboard instead of sending them immediately. The stored messages can be sent with a keyboard command.
"RUB-OUT" Function: You can correct mistakes while writing messages in the buffer memory. Misspellings can also be erased while the information is still in the buffer memory.
Automatic CR/LF: While transmitting. CR/LF automatically sent every 64, 72 or 80 characters.
WORD MODE operation: Characters can be transmitted by word groupings, not every character, from the buffer memory with keyboard instruction.
LINE MODE operation: Characters can be transmitted by line groupings from the buffer memory.
WORD-WRAP-AROUND operation: In receive mode, WORD-WRAP-AROUND prevents the last word of the line from splitting in two and makes the screen easily read.
"ECHO" Function: With a keyboard instruction, received data can be read and sent out at the same time. This function enables a cassette tape recorder to be used as a back-up memory, and a system can be created just like telex which uses paper tape.
Cursor Control Function: Full cursor control (up/down, left/right) is available from the keyboard. Test Message Function: "RY" and "QBF" test messages can be repeated with this function.
MARK-AND-BREAK (SPACE-AND-BREAK) System: Either mark or space tone can be used to copy RTTY.
Variable CW weights: For CW transmission, weights (ratio of dot to dash) can be changed within the limits of 1:3-1:6.
Audio Monitor Circuit: A built-in audio monitor circuit with an automatic transmit/receive switch enables checking of the transmitting and receiving state. In receive mode, it is possible to check the output of the mark filter, the space filter and AGC amplifier prior to the filters.
CW Practice Function: The unit reads data from the hand key and displays the characters on the screen. CW keying output circuit works according to the key operation.
CW Random Generator: Output of CW random signal can be used as CW reading practice. **Bargraph LED Meter for Tuning:** Tuning of CW and RTTY is very easy with the bargraph LED meter. In addition, provision has been made for attachment of an oscilloscope to aid tuning.
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BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

This month I will devote my little contribution to the newsletter to the FADpad TNC , -7 Digipeater and modifications to the Xerox 820 computer board.

Much has been said about using the Xerox 820 computer board for packet radio. It is being used for the WORLI MailBox around the country, as a TNC, a dedicated digipeater, a 2-port controller, and will be used for the network controller for FADCA's GATOR-1 9600 baud linking.

Most of the work with the 820 in Florida has been done by Howard Goldstein, N2WX, in Palm Bay, FL. Howie's first use of the 820 was for the N2WX-7 digipeater which first went on the air using a state machine to extract the clock. Later he designed the FAD Board which uses the Zilog Z-8530A SCC chip.

When Howie got involved in writing the software for the new TAPR TNC-2, he needed some hardware to test his code on, so the FADpad came to be. FADpad is the good old 820 with the FAD Board running a version of the TNC-2 software for the 820.

I will cover a little bit about the digipeater and FADpad software then get into how I put it all together. The digipeater code has become known around these parts as the -7 digipeater software because it was first used on N2WX-7. It will digipeat either AX25 Level 2 version 1 or 2 protocol. It has a heard log that can be activated by sending an unproto frame with the text of "/xxxLOG". The three letter mnemonic of the LAN where the digipeater is located is subsitituted for the xxx. When the heard log is activated, it transmits a list of the calls heard back over the same digipeater path that the /xxxLOG was sent. The -7 code also has a new feature that Howie added last month. It will respond to either the normal call letters or the mnemonic of the LAN city name like MLB. Every 10 minutes it sends a repeater ID frame to keep legal.

The FADpad software uses the same commands as the TAPR TNC-2 (see last month's BEACON article) and works just like the TNC-2. Some of the many new features include a heard log with date/time stamp, display of the digipeater route in monitor mode with date/time stamp, display of connect and disconnect frames, a connect message, automatic AX25 Level 2 version 1 or 2 selection on connect and more.

The default ABAUD and MYCALL must be programmed into the EPROM when they are burned because it does not have NOVRAM or battery backed up static ram. The EPROM default HBAUD is 1200. Both ABAUD and HBAUD can be changed at power up by wiring a DB25 plug in the keyboard socket per figure 2. (The FADpad uses a serial terminal instead of the built in keyboard and video interfaces). The default AWLEN is 7 and PARTIY is EVEN.

The -7 digipeater code will fit in one 2716 EPROM but the FADpad software requires two 2764s. Below I will tell you how to modify the 820 for 2764s but if you only intend to use it as a digipeater that mod is not required.

2764 EPROM Modification

1. Remove U63 and U64 (2716) from their sockets.
2. Unsolder and remove U62 (74LS138) and save it for later.
3. Install a 16 pin socket at U62.
4. Bend pins 1, 2 & 3 of the 74LS138 out of the way and reinstall the chip in the socket at U62.
5. Solder a wire from pins 2 & 3 U62 (74LS138) to ground and from pin 1 U62 to pin 6 U35 (74LS373) address line A13.
6. Bend pin 23 out on two 28 pin dip sockets. Connect both of these pins to pin 2 U35 (74LS373) address line A11.
7. Connect pin 2 of the two 28 pin sockets to pin 5 U35 (74LS373) address line A12.
8. Connect pins 1, 27 & 28 of the two 28 pin sockets to +5 volts.
9. Install the sockets in the old U63 and U64 sockets in such a way that pins 14 and 15 of the new socket plug into pins 12 and 13 of the old 24 pin socket. This will leave pins 1, 2, 27 & 28 hanging out in space with your wires attached.
10. Make sure that pin 23, the one that was bent out does not come in contact with the old socket. A small piece of tape will take care of this.

Modifications for FAD Board Installation

1. Remove U92 (2716) and U109 (1771) from their sockets. They are not used.
2. Remove U101 (3881) the GPPIO and U102 (74LS243) from the board by desoldering them. They will not be used.
3. Install a 40 pin dip socket at U101. Make sure the socket that you use has holes large enough for the pins of a 40 pin wire wrap socket to be plugged into it. The FAD Board will plug in here.
4. Connect a wire from the hole at pin 3 where U102 was removed to +12 volts and pin 6 in the same fashion to - 12 volts.
5. This step is for the -7 digipeater watchdog reset pulse and is not required for the FADpad. Connect from the pin 4 hole of old U102 to pin 12 U117 (7406) and from hole 5 U102 to the center post of the reset switch on the side away from the edge of the board.

I found that I had to remove the plate over the DB25 connectors in order to plug the FAD Board into the 40 pin socket. Be sure you keep the pins lined up and apply power and check voltages before you install the FAD Board chips. I used the top guide from a 40 pin socket over the wire wrap pins to keep them aligned. See figure 1 for the 820 power connector wiring.

For the FADpad, plug your computer or terminal into the DB25 connector marked for the printer. The pin discription is as follows:

PIN	USE
2	Serial data going TO the tnc
3	Serial data coming FROM the tnc
4	Asserted - Okay to send FROM the TNC (i.e. the user is ready to receive) (optional)
7	Signal ground
8	Asserted - Okay to send TO the TNC (i.e. the TNC is ready to receive) (optional)

The FAD Board should be constructed and a 40 pin wire wrap socket installed at U8. Note that nothing plugs into this socket, the long wire wrap pins are used to plug into the 820 U101 socket. The layout is such that the FAD Board will be over the SIO (U96). If you don't want to do it this way, use a 40 pin dip jumper, but this makes a neater package.

The 1488 and 1489 (U4, U5 and U7) on the FAD Board are not used and need not be installed. Use a 2.4576 Mhz computer crystal.

The modem that I used was obtained from FADCA through Jerry Quimby, N4AJH. It is a small board using the XR-2211 and XR-2206. I mounted the modem on small standoffs right on the FAD Board. Connect the modem to the FAD Board as follows:

Modem	FAD Board
TTL Data In ----------	TxDa P1-5
TTL Data Out ----------	RxDa P1-1
Carrier Detect *Q ------	DCDa P1-19

I found that my modem worked better by changing C-7 from .022uf to .0022uf. If you use this modem, follow the tune up instructions that Jerry sends with it.

You must have a watchdog timer to reset the CPU for the -7 digipeater software. It will not work without it. It is a good idea to have a transmitter timer as well for both the digipeater and the FADpad. I built the circuits shown in figure 3 and 4 on the wire wrap area of the FAD Board using a 556 timer that does both functions. I also installed a VFET VN10KN for PTT switching. The watchdog is from the August 1984 FADCA>BEACON and the transmitter timer was copied from the TAPR Beta TNC.

This completes the construction of either a -7 digipeater of FADpad depending on what EPROM(s) you plug in. Here is where to get the components.

Xerox 820-1 boards can be gotten from Xerox at (214) 960-3367. They go for about $50.00. There are other sources also, such as BNF Enterprises, 119 Foster St., PO Box 3357, Peabody, MA 01961-3357.

FAD Board bare PC boards from TAPR (602) 746-1166 for $25.00.

Continued >>>

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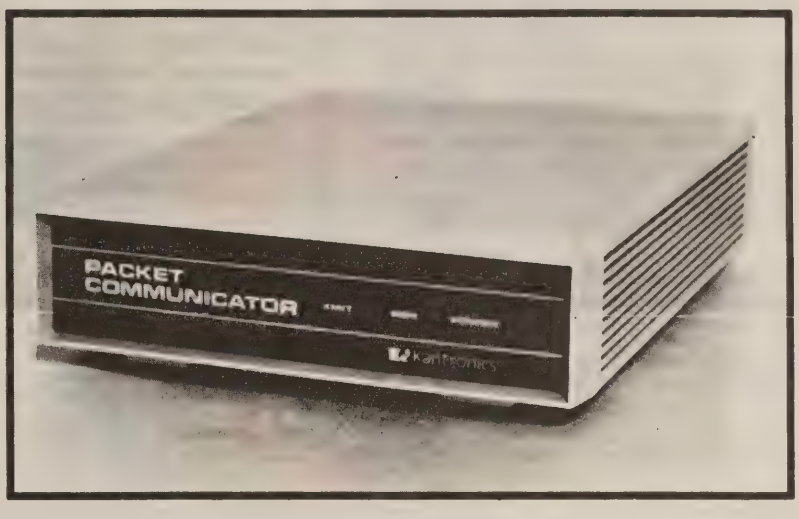

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2.4576 crystal (HC-18 case) from Digikey (800) 344-4530. Their part number X069 - $2.85.

FADCA Modem bare board, $8.95 from Jerry Quimby, 601 Verbenia Dr, Satellite Beach, FL 32937.

Z-8530A SCC chip $20.00 from FADCA, 812 Childers Loop, Brandon, FL 33511.

I am sure that you can get most all of the rest of the parts from Radio Shack but I ordered mine from Digi-key and saved a few bucks.

The firmware can be ordered from me; Ted Huf, 1829 N.W. Pinetree Way, Stuart, FL 33494. The -7 digipeater code is $10.00 on a 2764 or $5.00 on a 2716. Let me know the call plus SSID number and mne-monic for the LAN city name plus SSID number. Also give me what you want the repeater ID text to say.

The FADpad firmware is $20.00 for the two 2764s. I need to know the default MYCALL and SSID number and the default ABAUD.

All proceeds from the sale of firmware goes to FADCA.

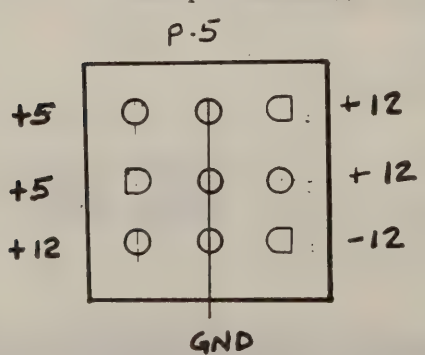
FIGURE 2
DB 25P (plugs into Keyboard Jack J2)

PIN	DESCRIPTION			
1	A0			
2	A1	---------->	see chart 3a.	
3	A2		select in BCD	
4	A3			
	Select HDLC Baud Rate by GROUNDING one contact.			
5	H110	x	-	o
6	H300	x	-	o
7	H1200	x	-	o <--defualt
8	H9600	x	-	o

CHART 3a
Asynchronous (user) baud rate

A3	A2	A1	A0	
-	-	-	-	Not used
-	-	-	x	73 Baud
-	-	x	-	110
-	-	x	x	134.5
-	x	-	-	150
-	x	-	x	300
-	x	x	-	600
-	x	x	x	1200
x	-	-	-	1800
x	-	-	x	2000
x	-	x	-	2400
x	-	x	x	3600
x	x	-	-	4800 <---default
x	x	x	-	9600
x	x	x	x	19200 (untested - not recommended)

key: x = connect pin to ground
- = leave pin unattached



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FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM. NCS: K4NTA

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 8:30 PM EDT. NCS: KF4EF

BREVARD COUNTY AREA: 147.060 (+600) Sunday 8 PM. NCS: N2WX

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

Florida (and most of SOUTHNET) Packet Frequencies

LAN and calling freq: 145.010
Local QSOs & file xfers:
145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):
221.720, 221.780
Narrow bandwidth linking:
221.400 (20 KHz b/w)
Medium bandwidth linking :
220.570 (100 KHz b/w)

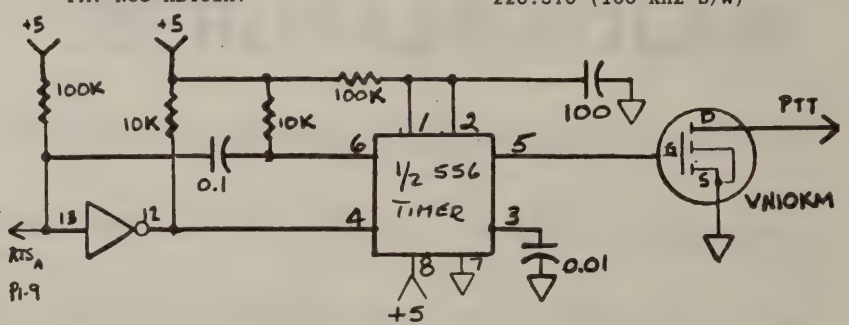


FIGURE 3
TRANSMIT TIMER

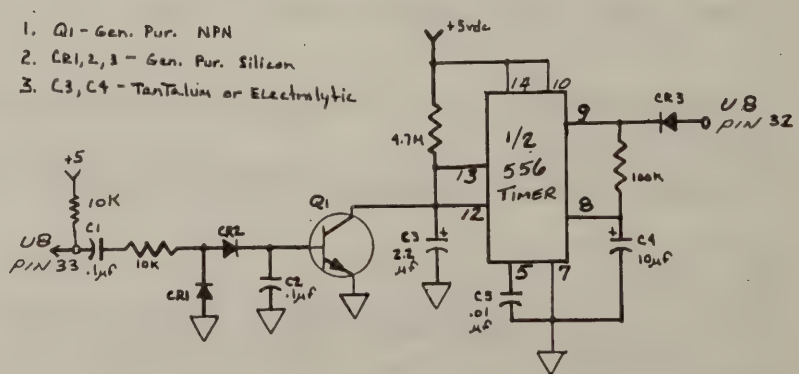


FIGURE 4
CPU WATCH DOG

SOUTHNET II

PACKET RADIO CONFERENCE

NOVEMBER 23 AND 24, 1985

HOSTED BY
GEORGIA TECH AMATEUR RADIO CLUB
SPONSORED BY
GRAPES
GEORGIA RADIO AMATEUR PACKET ENTHUSIAST SOCIETY

TO BE HELD ON THE CAMPUS OF GEORGIA TECH
ATLANTA, GEORGIA
TECHNICAL SESSIONS ON SATURDAY FROM 8:30 TO 5:00
SESSIONS ON SUNDAY FROM 8:30 TO 12:00
INFORMAL GET-TOGETHER ON FRIDAY THE 22ND
FORMAL DINNER ON SATURDAY EVENING

FUTHER DETAILED INFORMATION TO BE ANNOUNCED

WE WELCOME ANY FORMAL OR INFORMAL PRESENTATIONS AND OR FORUMS
DEALING WITH PACKET RADIO OR RELATED SUBJECTS.

IF YOU DESIRE TO PARTICIPATE PLEASE COMPLETE THE BOTTOM PORTION OF THIS FORM AND RETURN IT TO:

BILL CREWS WB2CPV
1421 HAMPTON RIDGE ROAD
NORCROSS, GEORGIA 30093

NAME_____ CALL_____
ADDRESS _____ CITY _____
STATE _____ ZIP _____ PHONE _____
AMOUNT OF TIME DESIRED_____
AUDIO VISUAL AIDS REQUIRED _____
BRIEF ABSTRACT OF YOUR TOPIC _____

NEWS AND VIEWS

Gwyn Reedy, W1BEL

The Jacksonville Hamfest was a very enjoyable and successful event. W4PCM, WD4BIW, and WD4ASW obtained a commercial booth and provided equipment to demonstrate packet operations. Dick (PCM) set up a portable digipeater in the hospitality suite of the hamfest hotel so that the demonstration station could enter the network despite the noisy conditions in the hamfest center. W5HUQ also provided connectivity through his station. About 60 persons attended the seminar on packet conducted by Dick, Ted Huf, and yours truly. Several persons commented after the seminar that they really felt as if they now understood packet basics. There was no formal banquet since only two persons had signed up, but about 18 gathered for dinner and had a good time.

FADCA has achieved a milestone of sorts. Early this month our paid membership went over the 300 mark, a goal I had earlier only hoped would be met by year's end. I hope that means we are doing something right! The larger numbers do make it economically feasible to provide larger newsletters and better services to members. That is also true of the paid advertising we now carry in greater quantities. For each page of advertising, we can afford to publish an extra page of editorial material. I had to raise the prices on back issues since all are now produced on a copy machine. The Board of Directors will set the amount of 1986 dues at its next meeting.

The Board of Directors election results are not yet available. All ballots that arrive no later than August 30th will be counted, and the results will be published in the September BEACON, which should be mailed about Sept 10th.

I have received several comments about one of the advertisements carried in the July BEACON. My position is this: Within certain limits (to protect FADCA as the publisher) paid advertisers are free to present their products as they see fit. While I may disagree with their judgement about merchandising methods, I honor their right to do what they think is best. I believe our readership is well able to discern the real issues in selecting any digital equipment. I intend to provide evaluation articles, use reports, problem reports etc. as well as paid advertisements to make this newsletter continue to serve as a valuable source of technical and operational information.

The GRAPES committee that is working the second SOUTHNET Packetfest has a nice flyer in this issue. Bill, WB2CPV, and Eric, N4CI, are making excellent arrangements for the event. They could use additional help. Don't expect future packetfests to be entirely free of cost--the first one depended on donations for expenses and did not break even. The subsequent packetfest will be a 'really big' affair: The ARRL Board of Directors has indorsed the FADCA sponsorship of the Fifth ARRL Computer Networking Conference and Digital Committee Meeting to be held in conjunction with the Orlando Hamcation in March. I'm proud that we have been honored to host this event and want to make it a very memorable event for all of the packeteers in the region. A combined SOUTHNET packetfest/national conference and major hamfest should provide a real enjoyable weekend. I'm requesting people to volunteer now to begin working to make this the best networking conference to date.

The TAPR group now has the TNC2 ready to go and may be able to devote more time to developing networking hardware. They are considering a low cost/low power network controller board that could be produced in short order. Some GRAPES and FADCA members are also designing a more powerful controller that will be of great utility. Details on both these projects will follow in subsequent issues.

Alan Chandler, K6RFK, of AEA has commented that the 200 Hz shift now a defacto standard on HF packet is not best suited for the 300 bps data rate in use. This was pointed out early on by Paul Rinaldo, W4RI, in the proceedings of the FIRST ARRL Computer Networking Conference in October 1981. He designed the Packet Adaptive Modem using Minimum Shift Keying, but the design has never reached production. There has been quite a bit of negative comment on 14.103 MHz about changing the shift. My concern is that we should not set our shift and other parameters based on current legal constraints. What we have working now is adequate. Rather than optimize it, we should try to design equipment that will operate effectively at a higher data rate on HF while remaining within the conventional voice bandwidth. Then we should seek FCC approval for use of the gear, first on an STA, and then permanently. Its too early to standardize...

The increase in FADCA membership has included a great number of persons from the SOUTHNET area outside Florida, and in fact, the entire country. Selecting the material for inclusion in the BEACON is difficult because there are in effect three audiences: Florida, SOUTHNET, and other readers. In general, I am striving to include more technical and operational information of value to all readers, and just a bit less of local news. In discussions with GRAPES members, I offered to have the BEACON serve as the SOUTHNET publication, with inserts for local groups, if an equitable means for financing the operation could be found. Your comments are solicited.

WANTED: For the Salt Lake City PBBS. Scott, WA7UZO, the SLC PBBS sysop is looking for a Shugart 801R drive, and a cabinet (with power-supply) to house two such drives. Replies can be routed directly to Scott at: (801) 264-8121 (home), or 263-0519 (work).

CONNECT
- The Beginners' Column

Don Deem, KB4LLO

Packet bulletin boards (PBBSs); everyone has heard of them by now. Some of us like them, others have harsh words to describe them and their loading of the channel. I must confess that I had negative feelings about the PBBS system until my old friend Pat, KF4EF, took the time to properly introduce me to the system. I would like to now pass along to you what Pat taught me. Hopefully when you understand the WORLI system, and what it can do for you, those harsh words and thoughts will evaporate and PBBS usage will benefit more of our membership.

If you read last month's BEACON, you probably saw the article on the new MailBox system that most FADCA PBBSs have gone to. If you didn't read the BEACON, I suggest that you do so now before reading this column. My initial fear of the PBBS system was due to ignorance. I didn't know what to expect, or how to access the system. It's really quite simple. I'll use the KF4EF system as an example.

To connect to the system you type "C KF4EF (cr)", then you wait. Soon you will get the following message, "Hello Don, welcome to the KF4EF MailBox from Pat in Tampa, Florida." Then a notation of the time and date of your last sign on is presented. The next message you will see will read, "Type X (return) for menu with explanations, H (return) for help". and then you will see "Date 850728 Time 1347 last msg # 24, 8 active msgs (B,D,G,H,I,J,K,L,R,S,T,U,W,X)".

From this point on the system is user friendly in that you are given instructions to guide your use of the system. I would recommend that you access the system for the first time when traffic is at a minimum and that you try the various commands so that you become familiar with what you can and can't do. I followed this procedure and printed a hard copy of everything for future reference.

Let's assume that we are into the system and we wish to review the active messages. At this point the MailBox is awaiting a command. Since we want to review the active messages, type L (cr). After a short wait a listing of the numbers, titles, addressees and originators of the active messages will be displayed. If you had only wanted to review only your own message list, you would have typed "LM (cr)" instead of "L (cr)". If you wish to read message # 24, for example, you would type "r 24 (cr)". After a short delay, message #24 would appear on your screen. Once you have read your message it is a good policy to remove it from the system. To do this you would type "K 24 (cr)" (K = KILL). Be sure you put the space between the K and 24. Remember if you need help, type "H (cr)" and the system will provide some very useful information.

Continued >>>

Well, I think you can see how things work. Remember, if you make a mistake, the system will ask you "WHAT ?" and give you another chance. While you are in the system, take a look at a file titled "DOC.TNC". [ed note: DOC.TNC was printed in the July BEACON]. It's full of information. To download this file type "D DOC.TNC (cr)". Once you have completed your transaction and you wish to exit the system, just type "B (cr)", and you will soon disconnect.

Again, read last month's BEACON and try some of the other commands. You will find this PBBS a rather neat and effective means of sending a message around the state, and farther.

Here is a letter received from a fellow packeteer who needs information. If you have answers to his questions, either write him directly, or send the info to me and I will pass it along to him.

Dear Don,

Two weeks ago, I purchased one of the Kantronics Packet Communicators at the Atlanta Hamfest to use with a VIC-20 and a Tempo S-15 handheld. I am sad to say I'm still not on the air. I'm able to receive but not transmit. I have noticed the high level of enthusiam that both your group (FADCA) and GRAPES have and would appreciate any helpful hints that you may have for general use of packet and specifically for use on the VIC-20. Also if you know of someone who has a "TU" program for the VIC, I would like a copy as the one in the manual does not work properly, i.e., control characters.

How do you keep data from scrolling off the screen?

Can you dump the received data to a tape?

How do you store several messages that may be transmitted later? One of my major interests in packet is traffic handling in and out of NC and SC.

In using voice, thru the repeaters, we can transmit within a hundred mile radius. On simplex, as you know, this is reduced significantly. What kind of range can one expect on simplex using packet and a 5/8 wave antenna ?

What kind of range with a two meter beam?

Sorry, I forgot to say with 1 to 5 watts.

Hopefully I will be able to attend the next meeting of SOUTHNET in Atlanta.

Thanks for the help and any words of wisdom will be appreciated.

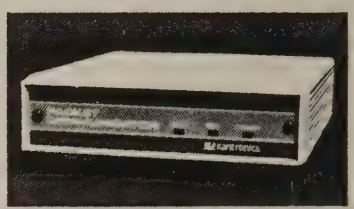
Willie Nelson, KA4YEA
611 Regency Circle
Anderson, SC 29621

CURT PARRISH, K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melbourne, Florida 32901
(305) 723-8659

THE CHOICE IS YOURS

Available: August (?)

- Unassembled Kit
- No Warranty
- Service Assistance (?)



Available: April, 1985
Dayton

Price: NOW $219.00

- Fully Assembled Unit
- Full One-Year Warranty
- Complete Service Facility & Staff

BUT LOOK BEFORE YOU LEAP

Both units are Packet Radio Terminal Node controllers with AX.25 protocol, a standard RS-232 compatible port, and command format software. But many differences exist too.

Buying the Kantronics Packet Communicator makes sense. You know our reputation for quality products and after-sales-support. You know the Kantronics tradition of making computer interfaces and software that work. So take your pick, the unassembled kit with no warranty, or the guaranteed Kantronics Packet Communicator, ready to work in your shack.

With a price of $219 we think the Kantronics Packet Communicator is more than a bargain, it's the smartest buy you'll make this year.

Kantronics
1202 E. 23rd Street (913) 842-7745
Lawrence, Kansas 66046

NETWORKING

Jack Brindle, WA4FIB

The task of carrying data from one station to another is the domain of the OSI model's Physical layer. As was shown last month, the transmissions simply transport signals from the sending modem to the receiving station. There is a major problem with errors creeping into the transmissions so that the received data may bear no resemblence to that originally transmitted. Therefore something must be done to check for errors in each transmission so that correct data is transferred to the proper end user. This task is accomplished by the second layer of the model, known as the data link layer. If the physical layer is thought of as a leaky pipe, the data link layer would be the the pipe cement used to fix the pipe.

The domain of the link layer is to assure that data for the destination station is properly received by that station. The transmitting station must provide information indicating the call, or address, of the destination and information to be used in checking for transmission errors. Additional information is included to help the receiving station determine its action when an error is detected.

The data link layer is the first layer at which the transmitted data bits have significance. The physical layer simply transmits the data as it would any other type of information. The link layer must make sense of the data it received from the physical layer. To allow this, the data is provided by the sending station's terminal node controller in standard bit patterns that are easily handled by the receiver. These patterns consist of eight bit "octets" or bytes that make up data fields. The layer two fields indicate the destination call, the sending station's call, control information, the actual data to be sent, and a field containing error detection information. The fields are bracketed by unique bit patterns that indicate the status and end of the data "frame."

Let's now discuss each field individually. Refer to figure 1 for the placement of fields in the packet. The "flag" begins a transmission, allowing the receiving station to synchronize on the inbound data stream. The flag byte consists of a unique pattern, hex 7E, which cannot exist elsewhere in the data stream. Obviously someone at some time will want to transfer that pattern. It is up to the hardware encoders and decoders (the HDLC chips) to insert and delete bits in such a fashion that allows data to be transferred without generating the flag byte except when it is desired. Hardware chips such as Zilog's 8530 SCC do this quite well. The same pattern is used at the end of the data to indicate data termination. These are the only places that flag bytes appear.

The next field contains the call, or address, of the destination station. Each TNC must watch this field in each packet to see if it should respond to the packet. In the AX.25 protocol the address consists of the call of the receiving ham station. This field is seven bytes long to allow for six character calls plus an additional four bit subdestination field that allows several stations to be run under one amateur's call. This is commonly done for digipeaters, bulletin boards and other auxiliary packet functions. The following field consists of seven bytes making up the transmitting station's call. This field follows the same format as the destination field. These two fields provide the source and destination of a "point-to-point" link. This is the mode in which current packet activity operates, and allows data to be transferred between two stations directly without an intervening network. It is important to note that point-to-point systems do not make up a network, they simply allow for the transfer of information between two directly connected stations. The distinction between point-to-point systems and a network is that networked stations may use network nodes to facilitate a "virtual" connection to simulate a direct connection, while in point-to-point systems the stations are directly connected.

In order to allow for greater range in packet communications, the AX.25 protocol contains up to eight optional repeater fields. Each field contains the call of a packet station that will receive the packet, then retransmit it towards the destination station. The "digipeaters," as they are called, are not actually part of the connection, they simply facilitate the connection between the originator and destination. The only active role digipeaters play involves error detection; if they receive a packet with errors, they simply ignore the packet. The destnation station will eventually notice the lack of a packet and request a retransmission. Otherwise the digipeaters are totally passive. It should be noted that the connection can be between two directly connected users with or without intervening dipeaters, or between two nodes in a network. We will return to this point later with the networking discussion.

After the digipeater fields comes an eight bit control field. This field contains two counts maintained by the two stations in the connection. One field is a three bit modulo-8 count of the current packet. This count is compared by the receiving station with the count it is expecting to receive. If the two numbers do not match, the receiver will notify the sender, resulting in a retransmission. The second field contains the last packet the station correctly received. The receiving station periodically sends a packet to the sender acknowledging the valid packets received. If this is different from the last packet sent, the sending station will retransmit the lost packets. The sending station is able to solicit acknowledents from the receiving station through the poll/final (P/F) bit in the control field. The exact meaning of this bit depends on the type of packet, but essentially it requests the receiving station to acknowledge the transmitted information.

The next field is called the Protocol identification field (PID). Since the architects of the AX.25 layer 2 protocol knew there was no layer 3 specification, they allowed packeteers to experiment with protocols at that layer, and indicate the protocol used with the PID byte. Several different protocols have been proposed, each given a unique identifier. This allows the connecting stations to pick the upper layer protocols they will use for their QSO.

The actual data to be transferred comes next. The data actually consists of the user's QSO information plus any data that upper layers have added to facilitate the QSO. The present TAPR type TNCs simply place the data typed at the keyboard in this slot. The data field is also used to convey information between the two TNCs about the connection. This information includes connection set-up and disconnect requests along with other similar data.

The final field before the closing flag is the CRC word. The CRC, or cyclic redundancy check, is a complex polynomial summation of the individual bits in the packet. The transmitting TNC generates the CRC, placing it at the end of the packet. The receiving station calculates its own CRC as it receives the data. When the complete packet is received, as indicated by the closing flag the calculted CRC should be equal to the value hex FFFF. Any other value indicates an error. Note that the transmitted CRC is included in that CRC calculated by the receiver.

This presentation described the protocol used at the data link layer; next month we will continue the discussion about the point-to-point and networking systems in order to lay a basis for the networking discussion.

FLAG	-	1 BYTE
DESTINATION	-	7 BYTES
SOURCE	-	7 BYTES
DIGIPEATER 1	-	7 BYTES
DIGIPEATER 2	-	7 BYTES
DIGIPEATER 3	-	7 BYTES

(OPTIONAL - THE NUMBER OF FIELDS USED IS THE SAME AS THE NUMBER OF DIGIPEATERS USED, UP TO EIGHT DIGIPEATERS, EACH USING 7 BYTES FOR ITS CALL.)

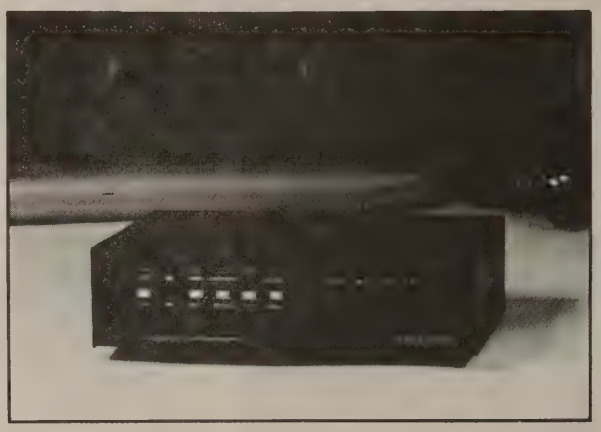
DIGIPEATER 8	-	7 BYTES
CONTROL	-	1 BYTE
PID	-	1 BYTE
DATA	-	256 BYTES MAX
CRC	-	2 BYTES
FLAG	-	1 BYTE

FIGURE 1 - AX.25 LAYER 2 FORMAT

So You Want To Try Something New? How 'Bout The AEA Packet Breakthrough!

Because:

You want to recreate the thrill of your first ham contact!
You'd like to learn something new!
You want to send error-free messages on HF/VHF/Satellite in spite of QRM!
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.



In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

```
AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA
   PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:
```

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5-6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

See your favorite AEA dealer, clip and send the coupon, or call John Gates, N7BTI (the AEA Packetman) at (206) 775-7373.

AEA INC., P.O. BOX C-2160, LYNNWOOD, WA 98036
OK AEA, send packet information to:

Name _____ Date _____
Street _____
City, State _____
Zip _____ Call me at _____

Advanced Electronic Applications, Inc.
P.O. BOX C-2160 • LYNNWOOD, WA 98036
(206) 775-7373 • TELEX: 152571 AEA INTL

PANHANDLE NEWS

From the pen of K3NN

The Crestview, Florida digipeater is on the air. It's a little sick but it's on. It represents a real team effort and shows what can be done when a group of people decide they want to work together to get a LAN going. Four months ago none of us could even spell digi. Now we have a pretty active group. Six of us each kicked in $33 and change to buy a used Heath TNC we found at a real good price. The North Okaloosa County Amateur Radio Club got us a spot on the same tower they use for their 147.36 voice repeater and let us use their old piece of 75 ohm cable TV hardline. KB4FSK, Gill, loaned us his precious Isopole antenna. K4LPT, Stan loaned us his 80 watt amplifier, a 40 amp power supply and his call sign. I ordered some 145.010 rocks from Jan Crystals for my old Regency HR-2 transceiver. WB4CDR (who is not yet into packet) shinnied 215 feet up the tower to hook up the antenna,and K4LPT-1 was born. The routing ID has since been changed to CEW (Crestview) and the call is now K4LPT/R.

Last month lightning rained from the sky and put us out of business. LPT's amp and supply paid the ultimate price and are still in the radio hospital being resurrected. The TNC had its brains scrambled but after reprogramming it seems as good as new. The Regency was unharmed so we're back on with about 6 watts. I guess primitiveness has its own unique kind of invulnerability to disaster.

We are now working on digipeater upgrades. We hope to have an 80 watt rig with a hotter receiver on line soon to replace the Regency and amplifier. We also got a used DB Products 9 DB gain antenna at the Atlanta Hamfest for 90 bucks. Unfortunately the antenna is still in Atlanta but we'll move it down here any day now. When we do we'll put it on the East side of the tower where it belongs and feed it with our new (to us) (only slightly used) 52 ohm Heliax.

We now have the Isopole on the West side of the tower because it was easy to put it there. It needs to be on the East side because it's a big tower and the RF has trouble getting through it on its way to Panama City where WD4FJE, Virginia, lives. She was one of the six original contributers to the TNC buy and we feel guilty about the poor signal the digi puts into her area. We also need to favor the East to eventually link to the rest of Florida. An important element of that link may be the new WD4ROJ-1 digi in Enterprise, Alabama.

On July 18, we sent a group of missionaries to demo packet at an Enterprise Radio Club meeting. The demo was a success. It netted us at least four converts who are now impatiently awaiting arrival of their Kantronics TNCs. All these in addition to WA4YQT, Tom, who was already a true beleiver and the first kid on his block to have his very own TNC. By the time this issue hits the streets, their ROJ-1 digi should be on with 80 watts, a GLB board and an antenna 120 feet above the highest terrain in the area. We are really looking forward to it as this will be our first reliable link to another area.

W5WZF, Bill, in Brewton, Alabama advised they are planning a digi at about 100 feet. I have no more details but this will probably be our second intra-LAN link.

Our Sunday night packet voice net on 147.36 is averaging ten stations per session. It seems to be a good vehicle for stimulating interest in the general ham community. Subjects range from "Hey, what's this packet jazz anyway?" to fairly technical. Our encouragement of questions like the former seems to be paying off.

Our first bulletin board, run by WB5LPG, Chuck, showed up a couple weeks ago. Chuck adapted a telephone modem BBS program to packet and is running it on an Apple. It has the unique feature of direct access to NOAA weather transmissions including hurricane information and local agnostications (the Handbook of Meteorology defines agnostic report as a prognostic report that no one believes).

We are all really anxious for a reliable link to the rest of Florida but we'll probably be linked to the Atlanta gang first as most of that structure is already in place. It's a long way from here to Tallahassee and rumors of impending activity in that key city have faded in the past few months. W1BEL and I have discussed a possible HF gateway. Sounds interesting. We'll have to investigate it further.

NON-ELECTRONIC MAIL

Dear Gwyn,

Was very pleased to have been your "Best DX" on packet, at least as of 01/0510Z JUN 85, but must say I was even more surprised to hear about it from Andy, NOCCZ!!! [Andy, NOCCZ, is the founder of the Rocky Mountain Packet Radio Society.] As I am sure he told you, we have been friends for years and tested on the same day for our tickets and he is the one "most responsible" for my involvement in packet radio. He has been my major source of answers whenever I have questions or problems about packet.

As you may have gathered from our brief contact, San Antonio is a "desert" of packet activity - but it is growing. One week ago the activity here increased by 100% - there are now two of us on (WD5DOE)!!! Things are looking up for the very near future tho. I have almost everything together to provide the first wide area digipeater here which will give us access into Austin (appx 8 stations) as soon as theirs is up and we will shortly have access into Corpus Christi (appx 12 stations) via a voice-link system. Hopefully this will become reality by the end of July or first part of August. I might add that WD5GAZ has installed a wide area digipeater in Houston at 800 feet that is accessible about 30-50% of the time from here, depending on band conditions.

I had posed several questions to Andy in our last conversation and he deferred to you - so blame him if I put you on the spot, HI HI.

First, I would appreciate any information you might have about anyone working on or operating a PBBS using the Commodore 64, especially one that is similar to the WORLI PBBS. Is anyone investigating the possibilities that the new C-128 might run the WORLI code in its CPM mode? As a side note, I have a modified VIDCOM MSO for packet but it is somewhat limited and is cumbersome for the sysop.

Second, what are others using for "status line" for PBBS or with various terminal programs to indicate "connected" or "carrier present" - as in telephone BBS operation? I am somewhat familiar with the add-on to the parallel port for connect status, but that seems to leave one hung up on how to initiate a connection!(?)

Third, have members of FADCA encountered and/or solved the problem of the effects of the tone-control on a Yaesu FT726-R when in the FM mode? (I have installed the IF filter mod for OSCAR [SSB] operation as discovered by W3IWI.) The tone control greatly affects the detection of received packets and I have found the fully clockwise setting provides the best operation, but I am not certain that it provides the optimum possible.

The last question has nothing specifically to do with packet, but would appreciate you spreading the word. I have a Drake UV-3 and desperately need a set of prints for it. They are no longer available from Drake and I am putting out the word anywhere I can. Am more than willing to pay for reproduction and shipping costs.

Again, Gwyn, thanks so very much for the contact and for whatever you can do to answer my questions or for any information you can send - I need all the help I can get. Being the first on packet in an area is certainly a challenge but it does have its frustrations!!

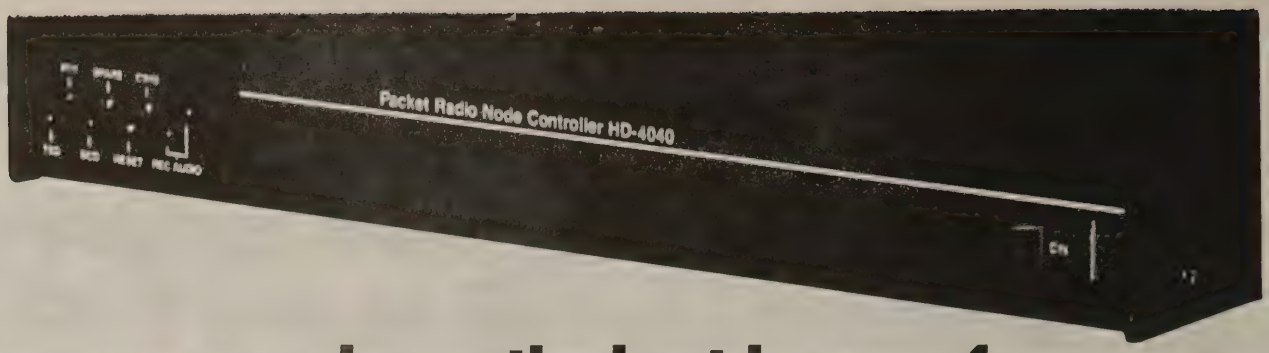
My congratulations (or condolences) on taking over as editor of the PSR. Am looking forward to the first copy. Andy has told me that FADCA puts out the best newsletter there is!! Hope it leaves you some time for hamming.

73's
Harry F. Ridenhour, NOCCW
14218 Ridgedale
San Antonio, TX 78223
(512) 654-4405

Dear FADCA,

I recently joined FADCA and have enjoyed reading the articles that were written earlier this year. The National Traffic System is one of my major interests and I would appreciate any information you may have regarding the FPTN (Florida Packet Traffic Net.)

It may be some time before we can establish a Packet Traffic Net in SC/NC, however I would like to begin organizing now. Continued >>>



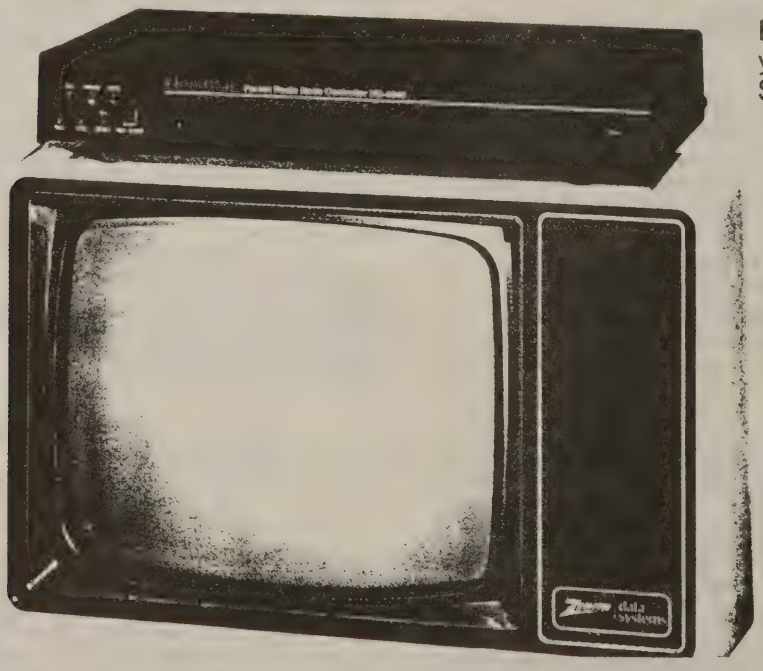
Now you can experience the best in error-free packet radio transmission with Heath's new HD-4040 Terminal Node Controller Kit

The only news more exciting than packet radio is the Heath Terminal Node Controller because it represents the best in packet radio equipment. In fact, it's the only RFI approved, FCC certified terminal node controller available. Designed in the Heath tradition of quality and affordability, the HD-4040 is the best equipment at the best price.

A version of the popular Tucson Amateur Packet Radio (TAPR), the Heath TNC combines computer technology with Amateur Radio to open up the world of packet radio and its countless applications. Just type in your messages on the keyboard of a terminal or computer and the Heath Terminal Node Controller does the rest. It allows you to run your station more efficiently and with more activity and variety of uses than were ever possible before.

With Heath's TNC you can: send messages at speeds up to 1200 baud or higher; extend your station's range by relaying transmissions through up to eight stations; leave a message at a friend's shack; automatically transmit your call letters and a message; converse via satellite; receive computer programs; participate in bulletin boards and more. All error-free, fast and without worries about QRM.

The Heath TNC Kit features built-in quality. It has an integral 1200 baud modem and extended baud rates up to 19,600 using an external modem and optional clock. It also has an automatic beacon, digital repeater, RS-232C serial port, parallel port, and eight operational lights for complete TNC status at a glance. The TNC comes with Heath's well-known and well-illustrated step-by-step assembly manual.



Experience packet radio communication yourself at the Heath Hamvention booth. See why packet radio is changing the future of Amateur Radio...and how Heath is leading the way with its quality packet radio equipment.

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We can handle traffic into NC or SC as we meet on the NTS regularly. Thank you for any information you might be able to provide.

Best Regards 73,
Al Nelson, KA4YEA
611 Regency Circle
Anderson, SC 29621

Dear Gwyn,

I enjoyed our telephone conversation on July 20th very much. The packet activity seems to be building here in North Carolina as I guess it is everywhere. The group that I am involved with is located in the Western Piedmont section of NC, very close to where you were when you worked WA4MDW. The following is a list of the hams in my area that are either on packet or seriously interested in packet operation.

Hank Rowland, W9MY
Brant Hass, WA4MDW
Karl Lambert, WB4UDS
George McCutcheon, N4CYG
Buddy Lowman, WD4GQU

Please enter my subscription to the FADCA newsletter. The copies that I have been able to come across have been very informative thus far. I received the information that you sent me for the Asheville Hamfest on Saturday so I'll take it along and hand it out.

Sincerely,
Mike Fowler, WB4PML

NTS Traffic and SOUTHNET Packet Communications

The following information was taken from SOUTHNET MailBox station N2WX-1, Palm Bay, FL.

```
MSG# TR Size To  From  Date   Title
144  BN 808  ALL K4NTA 850716 NTS
             Traffic to W4LLA for QSP
332  BN 737  MLB K4NTA 850715 NTS
             Tfc on the K4NTA MailBox
164  BN 667  ALL K4NTA 850710 NTS
             Traffic on this MailBox
```

W4LLA will take NTS traffic for the National Traffic System and most points in Florida. Gil meets the Florida Midday Traffic Net and the Tropical Phone Net each noon and evening. Traffic for relay into the NTS MUST be in the ARRL NTS format with the header including the check. When entering NTS traffic into the MailBox, use the following command: ST W4LLA The message title should include the name of the city to which the traffic is going. Please always use the ST command for NTS traffic because the report summary that the MailBox generates lists NTS for reporting to the ARRL. I encourage you to send your NTS traffic through this MailBox and W4LLA. Thanks, Ted, K4NTA.

SAMPLE.MSG Here is a sample NTS format message for use on packet:

```
At the cmd prompt: ST W4LLA <CR>
At the Msg title prompt: Stonepile,
                         GA <CR>
NR  73 R N2WX  ARL 11  PALM BAY FL
  AUG 5
JOE AND MARY PACKET
167 MORSE ROAD
STONEPILE, GA
768-0031        BT
ARL FIFTY X HOW GOES IT QUERY REPLY
VIA UNINET 73 BT
HOWIE N2WX AR <CTL-Z>
```

Note: To send a <Ctl-Z> on a TAPR TNC1 or derivative TNC such as AEA and Heath, the operator should use the PASS command, <CTL-V> immediately followed by <CTL-Z><CR>.

DRNET

C2970 CC141 Phil R.Karn (ka9q,2979) 7/12/85
KEYS: /AUTHENTICATION WITHOUT ENCRYPTION/

For those of you interested in message authentication without encryption (i.e., the topic addressed by Paul Newland's paper in the last ARRL Computer Networking Conference) there is an interesting article on page 213 of the June 85 Data Communications.

Apparently there is already an ANSI standard (X9.9) for message authentication without encryption which is intended for electronic funds transfer applications between banks. The approach is similar to the one I suggested: compute some checksum-like function over the entire message, then encrypt the "checksum" and send it along with the message. The other end recomputes the checksum, decrypts the one that was sent, and compares the two to detect forgery or alteration of the message.

The article does not give details, but it seems to me that you have to be careful in designing the checksum function. If the bad guy knows it, he might be able to modify the message in such a way that the checksum (and therefore its encrypted version) is unchanged. This would be easy if the algorithm was simply, say, a sum of bytes or words across the message body.

Has anyone seen this standard or done more thinking about the problem of authentication without encryption? It appears that amateur radio is not unique in having an encryption prohibition -- some other countries have rules applying to commercial data communications as well, so it is possible that such experience might be applicable to amateur radio as well.

Phil

To: All
From: Pete WB9FLW
Subject: Need Info on DEC PDP-8

The local Packet group in St. Louis has aquired a DEC PDP-8 minicomputer. It seems to be in good shape and came with some software (word proccessing, database stuff). We would like to put this to some practical use on Packet!

Can anyone help us get info on its operating system and perhaps lead us in the right direction on getting the thing running as a host system? We would like to put DRNET info, Gateway & other large files on it for folks to download. We don't need a mailbox since we already have two of those.

Anybody got any ideas?

AX.25 Version 2 Multi-channel TNC FIRMWARE (version 0.5) for the TAPR TNC1 and Derivative Systems

Copyright 1985, Ronald E. Raikes (WA8DED)

This firmware supports the full AX.25 link layer protocol, version 2.0 as described in the ARRL specification dated October 1984, as well as the pre-existing version 1.x. This implementation supports multiple simultaneous link connections with either version protocol. This release has been assembled for a maximum of four simultaneous connections. Which protocol version is used to initiate a connection is controlled by a TNC command, but the version will be automatically changed, if necessary, to conform to the version of the TNC responding. (NOTE: The existing firmware supplied by TAPR for the TNC-1 will NOT digipeat version 2 protocol.)

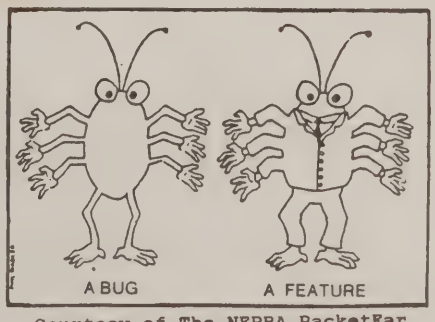
The firmware is contained in one 2764 EPROM, and is intended to be installed in a TAPR TNC-1 (or equivalent, such as the AEA PKT-1 or Heath HD-4040) in socket U12. This assumes that a 6264 RAM is already installed in socket U7, with an additional 6264 RAM optionally installed in socket U8 (recommended if multi-channel operation is intended).

The firmware source is written in 6809 assembly language. Emphasis was placed on using a state table driven design, utilizing the state tables provided in the ARRL specification. The source was assembled using a 6809 cross assembler from 2500 AD Software running on a Z-80/8086 TurboDOS development system (CP/M compatable).

[The above information was obtained from DRNET. The author promised more comprehensive information by mail, but it had not arrived by press time. Look for it next month.]

NOTICE

FADCA is planning to operate a 'Software Exchange' for packet, AMTOR, and other digital communication software. This project is just getting started and we need volunteers to copy diskettes and program EPROMS. Please contact me to participate. Software contributions also are solicited. So far, we have been offered several versions of TNC code for the Xerox 820, experimental AMTOR code that will work on the 820 and TNC2, and some terminal programs. More details next issue.



Courtesy of The NEPRA PacketEar

FADCA>BEACON

The FADCA>BEACON is published monthly by the Florida Amateur Digital Communications Association, Inc. (FADCA), 812 Childers Loop, Brandon, FL 33511.

Publisher and Editor - Gwyn Reedy, W1BEL
Layout Editor - Brad Voss, WB8ZPE
Mailing labels - Jim Homan, W4DPH
Postal Expense Support - Phil LaMarche, W9DVM
...And lots of help from many authors. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jim Diggs, K4AHO
Ted Huf, K4NTA
Tom Kneisel, K4GFG
Bill Sams, KF4LG
Dave Frey, K3AAX
Dick Klein, W4PCM
Gwyn Reedy, W1BEL
Bill Whitaker, WD4JKM

Officers:

President - Gwyn Reedy, W1BEL
Executive Vice President - Ted Huf, K4NTA
Secretary - Don Deem, KB4LLO
Treasurer - (vacant)

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (at least 56 cents) 8 1/2 by 11 inch envelope to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

FADCA>BEACON copies printed:

January 1985	- 575	May 1985	- 500
February 1985	- 565	June 1985	- 500
March 1985	-1000	July 1985	- 600
April 1985	- 500	August 1985	- 600

Information on advertising space in the FADCA>BEACON can be obtained by writing or calling the FADCA office. A rate and layout card is available on request.

Small classified advertisements for FADCA members will be without charge.

Any material appearing in the FADCA>BEACON may be reprinted in any non-profit amateur publication without further permission if credit is given to the author and the BEACON (including the FADCA address.) Commercial publications should contact the FADCA office to make reprinting arrangements.

The supply of Volume One (1984) of the FADCA>BEACON is exhausted. Single issues are available for reproduction and mailing costs of $1.00 per issue, or $8.00 for the entire year (11 issues). [NOTE THE PRICE CHANGE] Send your request to the FADCA address.

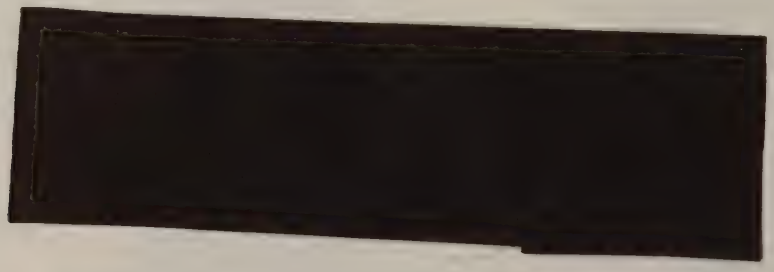
The DEADLINE for submissions for the SEPTEMBER issue of the FADCA > BEACON is AUGUST 30th. Articles should be in final form using a 35 character column width. Authors should request a style sheet from the editor.

DIGITAL EVENTS

AUG 24.	Broward "PACnic", CB Smith Park, 11 AM.
SEP 7/8.	Melbourne Hamfest. Contact N2WX.
OCT 12/13.	South Florida ARRL Suncoast Convention in St. Petersburg. Two full days of packet activities. Contact KB4LLO.
OCT 12/13.	Vero Beach Ham/Computerfest.
NOV 23/24.	Second SOUTHNET Packetfest hosted by GRAPES. A great weekend at Georgia Tech in Atlanta. Contact WB2CPV.
NOV 30/DEC 1.	Broward Hamfest. Contact K4GFG.
FEB 8/9.	Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park. Contact WD4JKM.
MAR	Orlando Hamcation. The Third SOUTHNET Packetfest in conjunction with the 5th ARRL Computer Networking Conference. Contact W1BEL or K4AHO.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

FLORIDA AMATEUR DIGITAL COMMUNICATIONS
ASSOCIATION, INCORPORATED (FADCA)
812 Childers Loop, Brandon, FL 33511



FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2, No. 9 Brandon, Florida September 1985

HEATH HD-4040 PRICE REDUCED

Heath Company of Benton Harbor, Michigan, has announced a price reduction of its HD-4040 Packet Radio TNC Kit. The price reduction began August 19, 1985. The HD-4040 which was selling for $299.95 has been reduced $50.00 to $249.95. The price reduction comes as a result of cost savings, principally due to quantity buys in the RAM and EPROM integrated circuits associated with the HD-4040.

Heath Company is grateful to the Amateur Radio community for the tremendous success of the HD-4040 TNC and wishes to apologize to those customers who have had to wait while productioon backorders existed. Heath Company hopes that an in-stock situation will occur within three weeks.

Wayne Wilson, WB8TSO, Product Line Manager for Amateur Radio products, said that, "We want to do everything to help promote Packet Radio that we can. We view Packet Radio as a genuinely new technology that will get inactive Hams back into the hobby and also attract computer users to Amateur Radio. In view of the dwindling number of Hams and their reduced influence and pliitical power, Packet Radio will play a key role in the future of Amateur Radio as a hobby."

WIN A TAPR TNC-2 IN FADCA'S MEMBERSHIP CONTEST

Beginning immediately, FADCA is conducting a contest to enroll new members. The rules are simple: The person who enrolls the most new FADCA members (more than 15) before January 31, 1986 will receive a TAPR TNC2 kit. Additional prizes will be awarded and a full listing of awards and rules will appear in the October BEACON.

You do not have to be a FADCA member to participate (but you can join and become your first 'credit'). New members do not have to have an amateur ticket or live in Florida. Credit will be awarded based on the annotation of the membership form by the new member with the name or callsign of the recruiting person. The new member will also receive credit for his own membership in case he wants to enter the contest.

A membership form is enclosed in this issue. Send a SASE for more membership forms and other promotional material. Get started now and help FADCA reach a membership of 500 by year's end.

Why is FADCA running this contest? We believe the FADCA>BEACON is a fine packet publication and want to get it out to many more packeteers. More members will allow the BEACON to contain more pages and FADCA will be able to provide better membership services.

73 MAG COMMENDS THE BEACON

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

NEWSLETTER OF THE MONTH

The Florida Amateur Digital Communications Association (FADCA) receives September's prize for its outstanding publication, the *FADCA>BEACON*. You'll not find a great deal of information about FADCA in the *BEACON*, no minutes of the last meeting, no endless pleas for club participation. In their place is a flood of material about packet radio—reviews of new equipment, modification and construction articles, tips, and techniques, all packed into a volume that becomes more a reference book than a newsletter.

Gwyn Reedy W1BEL puts it all together each month, with a small army lending assistance. The many names that appear on the masthead include Brad Voss WB8PZE, Cheryl Voss, David Hunt, Jim Homan W4DPH, Phil LaMarche W9DVM, and Pat Shaughnessy KF4EF, all of whom help Gwyn produce this exceptional journal.

To enter your club's newsletter in *73*'s Newsletter of the Month Contest, send it to *73*, 80 Pine Street, Peterborough NH 03458, Attn: Newsletter of the Month.

ELECTION RESULTS

FADCA's first election of Directors took place during August. The results of the balloting were certified by Sarah LaMarche, CPA. A big thanks to Sarah for her volunteer support. Five of the original 8 appointed directors, and three new persons won office. Congratulations to the winners, and thanks to everyone who showed the willingness to serve. The new Directors will have a number of committee posts to fill, so the opportunities to participate are still open. The first 8 names on the list below are the new Directors.

FLORIDA AMATEUR DIGITAL
COMMUNICATIONS ASSOCIATION, INC.
812 CHILDERS LOOP
BRANDON, FL 33511

I have tallied the ballots submitted to me by 70 members of the Florida Amateur Digital Communications Association, Inc. representing a total of 535 votes cast. The following shows an accurate talley of these votes.

Gwyn Reedy	69
Howard Goldstein	65
Ted Huf	65
Dick Klein	53
Jack Brindle	48
Jim Diggs	42
Andy Demartini	37
Bill Whitaker	37
---	---
Bill Bosley	30
Bill Sams	23
Kenneth Block	22
Joe Depietro	20
Jon Knapp	20
Joel Kandel	1
Keith O'Brien	1
Tom Kneisel	1
N4HMD	1

-signed-
SARAH R. LAMARCHE

IN THIS ISSUE

Discussion of Packet MailBox Concerns
Easy FM Xmtr Deviation Adjustment
Networking Tutorial
HF Adaptor for TNC1
600 Hz Shift On HF
Hurricane Elena Report
900 MHz Announcement and Bandplan
Bytes From The Write Only Memory---
Connect-The Beginners' Column
Non-Electronic Mail
Excerpts From Other Publications
The Junkbox - New and Used Parts
Advertisements
FADCA Nets and Packet Frequencies

ELENA – EMERGENCY OPERATIONS AND PACKET OPERATIONS

Jack Brindle, WA4FIB.

The last weekend of August saw the Florida Gulf coast threatened by the 100 plus mile an hour winds of Hurricane Elena. This situation presented amateurs with the "opportunity" to test our emergency operations capabilities. Those of us living on the beach were the first to be evacuated. After checking into the local emergency net, we were assigned to the evacuation center at Clearwater High School. Our purpose was to assist the medical personnel at the evacuation center in whatever way we could, including obtaining help from Red Cross headquarters in downtown Clearwater.

The people we were assisting in the evacuation center consisted of two or three nurses and, when we were lucky, a doctor. There were about 3000 evacuees in the shelter. Quite a few of the evacuees were elderly, and required medical attention in some way. Needless to say, there were few times when the medical station was not busy.

There were about 58 evacuation shelters, most of which were in communication with the Red Cross headquarters through the ham network.

Our station consisted of an ICOM IC2AT with magnetic mount 1/4 wave whip antenna. We also had a complete packet station consisting of a TAPR TNC, Macintosh computer and MacPacket software. As can be expected, little packet activity was heard during the hurricane.

Communications with Red Cross headquarters proceeded quite well, and we were generally able to get their help with little trouble. Because of the workload on the medical personnel, there were many times when we were pressed into service to run errands or perform some other task. During these times the ham station was unmanned. Several times the headquarters station tried unsuccessfully to get our attention. Other problems occured from the nature of the traffic we were handling. Several tries were required to get across the names of medications, like "Prednasone".

These problems are somewhat peculiar to voice operation, and could be eliminated through the use of packet radio. A packet station set up at each shelter would allow messages to be transferred even though an operator was temporarily away. Spellings would not be repeated since the receiving operator would see the medication name as it comes across. Also, there could be no confusion as to just what was requested, the operator could simply give the Red Cross people a printout of the request. Additionally, bulletins such as storm updates could be more easily transferred with the assurance that each station would receive them.

We were lucky in that at our shelter power was lost only for about ten minutes during the storm. A direct hit would greatly alter that situation. Thus we should design our emergency packet stations around power requirements. A station consisting of a Radio Shack Model 100 or similar lap-top computer and an all-CMOS TNC would be ideal. This would allow for battery operation when power fails. We do need to work on the digipeater system, however. KC2FF-7, located on the beach, lost power for about 48 hours during the storm and was obviously useless. The design of these stations needs to be looked at also. Again, low power should rule the design. We don't need high power transmitters during the storm since most operation is local. Perhaps a remote control facility to switch on and off a high power amplifier should be considered. Station location should be considered greatly as well. The storm surge from a direct hit could severly damage, if not destroy, some of the beach sites. Of course, high winds or tornadoes could also destroy high towers.

The bottom line from our Hurricane Elena operation is a need to find ways to improve our emergency operations capabilities. Packet provides some extremely useful methods if we can eliminate problems that will occur from storm related damage.

FADCA, PACKET, AND NTS

By means of this letter I wish to discuss with you the relationship between FADCA, a representative of the packet radio technology, and the National Traffic System (NTS). For decades, NTS has demonstrated its ability to handle third party traffic all across this land of ours with a very good reliabiltiy, although not notably speedily. Owing to its longevity, NTS is an established entity that may have some 'long hairs', but no matter how slow and archaic it may seem to some, the fact remains that is IS established as THE existing fountainhead of long-distance amateur radio traffic communications.

Recent advances in the digital teleprinting field have resulted in the marvel that we know as packet radio. I need not expound on the positive aspects of packet, else why are you reading this commentary. We must not let our unbounded enthusiasm for packet cloud the fact that not every amateur is fully aware of the benefits of packet communications. For us to succeed in presenting packet as THE future of non-real-time communications we MUST be very careful to make sure that a presentation is convincing and forthright, rather than a forced-feeding to the audience.

I have witnessed speakers that get a non-packet audience in hand and blow the act by telling the audience that NTS is 'dead' and that packet 'will replace NTS' etc. In my opinion, this type of approach is not amenable to the process of convincing NTS-type operators that packet is the thing to do.

For a presentation on packet-NTS relationships to succeed, the presentor must emphasize that we are not out to eliminate NTS from the face of the Earth! Rather we MUST convince NTS operators that packet will compliment (rather than supplant) existing NTS operations. Indeed, if packet communications does enough 'complimenting' it may eventually replace other methods, but that capability is not here yet and we must be very careful in our presentations so that we do not turn the NTS operator away from our doors. We must be persuasive rather than overbearing. Just throwing a bunch of statistics at the audience and then telling that same group to get with packet is not a convincing pitch. Please let us have some really tactful presentations that will sell, rather than beat-on-the-head. Given this approach, I feel that packet's interface with NTS will be a good one and will create friends, rather than opponents.

73,
Dick Jansson, WD4FAB

LOW SPEED LINKING

Tom Kneisel K4GFG

The search continues for 220 MHz RF equipment suitable for linking our SOUTHNET digipeaters. Tom, K6SOX reports modifying Midland 220 Mhz radios for use with the K9NG modem. The modifications were extensive, including the addition of a new IF filter and new IF IC. Tom reports the availability of the radios to be poor. He also reports something I observed with the Hamtronics FM-5's, that slight frequency netting errors cause severe degradation in lock time and performance of the modems. We both concluded that the modems are not suitable for 9600 baud operation with standard radios. The modems should function ok at 9600 baud if the radio IF is made wider, but if this is not done operation will be limited to 4800 baud.

I have begun testing the Icom IC-37A (220 Mhz) for suitability as a linking transceiver. Problems identified so far include T/R switching delays and transmit audio response. Although the synthesizer locks in 15 ms, the transmit frequency does not settle on channel for another 75 ms. (This is slow, but about the same delay as the K9NG modems/FM-5 radios with 2 Khz netting error.) An adaptive loop scheme in the IC-37A provides the fast lock time, then switches to a 20 Hz low frequency corner for modulating the VCO. For the K9NG modem, this is at least a factor of ten too high. Modification of the PLL constants to lower the corner frequency would not be advisable since it would only lengthen the loop settling time (already found to be rather lengthy).

Continued on page 7.

ACCURATE SETTING OF FM TRANSMITTER DEVIATION

Mort Cohan, KA1IU

(Reprinted from the NEPRA PacketEar, August, 1985)

This procedure will allow the deviation of an FM transmitter to be set to a high degree of accuracy. The only equipment required is an SSB receiver operable at the same frequency as the FM transmitter to be adjusted, and an audio generator that can produce 1200 to 1400 Hz, which can be a TNC in calibrate mode.

As audio modulation is applied to an FM system, the total power output remains the same, but the distribution of power between the carrier and the sidebands changes. Consider the dase of audio at a single frequency. As the amplitude of the audio increases, the carrier level will decrease and eventually reach zero. Beyond that point, the carrier level will start to increase again (with its phase reversed). The behavior of the carrier level as a single tone audiolevel varies is described by a mathematical function which, when plotted, looks somewhat like a damped cosine function (it's a Bessel function, J(0)). In an FM system modulated with one tone, the sidebands appear at multiples of the audio frequency, but for this exercise we will ignore the issue of what the sidebands do.

We describe the effect of the single tone by its modulation index, M. M = Deviation / Modulating Frequency. At M = 2.4, the first zero of the carrier level occurs. So the adjustment procedure involves the application of a single frequency to the FM microphone input, listening to the carrier tone on an SSB receiver, and adjusting the FM deviation (and perhaps the mic gain) to null the carrier tone. At that point, the deviation is simply 2.4 times the audio frequency. Using 1200 Hz gives a deviation of 2.88 KHz, and using 1400 Hz gives a deviation of 3.36 KHz, which is the optimum range for packet operation.

I find that an SSB receiver (I use an Icom 290-A) with nothing attached to its antenna connector, sitting about 15 feet from the FM gear and its dummy load, will pick up a fine signal from the FM unit. With pure carrier (no audio input to the FM rig) tune the SSB radio to produce about a 1400 Hz tone. Then apply the tone input to the FM rig and adjust its deviation control to null out the tone heard on the SSB receiver. Sidebands will appear, but most will be out of the SSB passband. The first one will be heard at twice the audio frequency of the carrier. Concentrate on the tone of the carrier and you will be able to ignore the high pitched sound of the sideband. Don't touch the SSB tuning after the FM tone input is applied. So many sidebands appear that you will never figure out what's where if you try to tune the SSB receiver over a modulated FM signal.

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

A lot has been said in the last few weeks about QRM caused by MailBoxes forwarding messages to each other. It was suggested by one person that the all of the MailBoxes should move to another frequency and the MailBox operators should be left to build their own network of digipeaters to link them together. I can't help but feel that this person must have been smoking funny cigarettes when he made that statement. The MailBoxes are important to packet radio. They provide a means of non-real-time message fowarding that you just cannot do otherwise. Just think about a Miami station who wanted to get some communications to a station in Tampa. He could try to connect to him direct through about seven digipeaters and

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Most operators will agree that the Mailboxes have a place on the packet network

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then not even find his radio turned on, or he could leave him a message on one of the Miami Mailboxes which would be fowarded to a Tampa Mailbox overnight by relaying it through several other MailBoxes. I think most will agree that this is a more effecient way of getting a message across the state.

Most operators will agree that the MailBoxes have a place on the packet network. I am the first to admit that a MailBox, through improper use, can QRM the network. Joe, WD4KAV, has a fine article in this month's BEACON on BBS use, but I would like to mention some of the things that I see cause lots of QRM.

One of the main causes of MailBox QRM is the DX operator. What is a DX operator? This is the guy who likes to explore all the BBSs and MailBoxes around the state that he can get into. The trouble is that he is going through a bunch of digipeaters and in some cases, at peak usage hours. His long distance use causes hits and retries thus slowing down the chatting operators with their much lower amounts of data being transmitted. As we have found, retries cause more retries until the network just stops getting anything through or someone retries out. The request here is that you only use your local MailBox or BBS unless you do your DXing after midnight and before 6PM.

Another big problem is the user who does not understand how to use the MailBox. This is the fellow who sends a LB and when nothing happens right away, he sends it again. What happens is that the MailBox receives both commands and sends out a list of ALL of the bulletins TWICE. It would help a lot if all users would read over the documentation and learn how to use a system as soon as possible. Here are a couple of hints on the WORLI MailBoxes. LB will get you a list of all bulletins from the word go, but a LB xxx where xxx equals the high message number from the last time you logged in, will only get a list of the new bulletins. Here is another; L lists all the new messages but LM only the ones for you. L> TROPIC will list only the Tropical Weather messages, L> SATDAT will get you the Oscar orbit data messages only.

At the present time we all seem to be using only one frequency on two meters. We all must learn to share it and use it in a way that will not cause problems to others. When the linking gets going, the problem of QRM on 145.01 will perhaps not be so bad. Until then we must try to work together to get the most effective use out of 145.01.

THE TAPR "AD" – DOES IT BELONG ON THE BBS?

(Reprinted from the NEPRA PacketEar, August 1985)

Nothing has stirred up feelings quite so much since W2NSD laid down his pen, as the recent appearance in most of our bulletin boards of a message which reprinted an announcement from the TAPR folks about the availability of TNC 2. Seems like some of us feel that the announcement, at least in its unmodified form, constituted something which violated the letter, and the spirit, of Part 97. Since this 'ad' is just the latest, and most extreme, of a lot of messages posted on our bulletin boards concerning things for sale, I think it is time that the amateur community gets all the issues out in the open and discusses them. There certainly is room for reasonable people to disagree, but my concern is that if we leave it up to the individual BBS operator to make every decision regarding propriety of contents, and don't offer them the support and advice of the rest of the amateur community, then it will be the FCC who finally makes the policy about bulletin board use, and we won't like their version very much.

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I don't think it is just an issue about whether the TAPR ad was legal [traffic] or not. That is certainly part of it, though. For myself, I read two parts of Part 97 that make me think that the announcement, as worded, was out of bounds [on the BBS]. Specifically, para. 97.110: The transmission of business communications by an amateur radio station is prohibited, except for emergency communications as defined in this Part.

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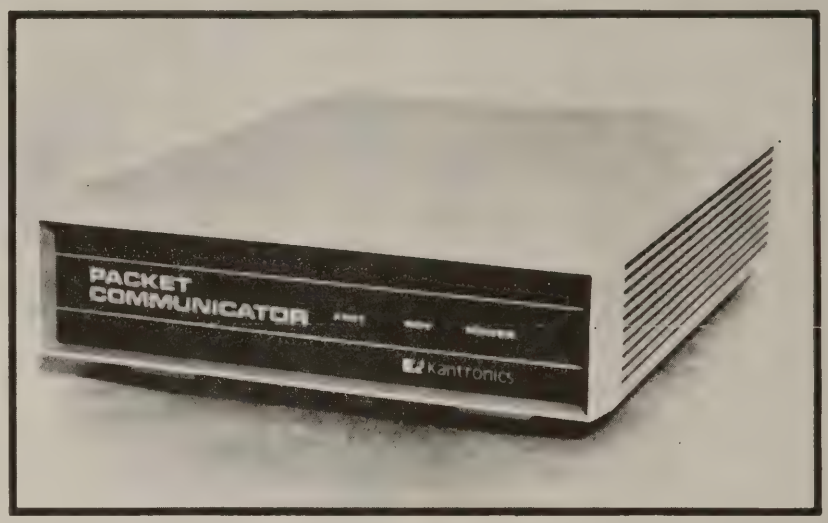
Kantronics has created a new Packet Terminal Node Controller that makes getting on Packet as easy as getting on RTTY. The unit is ready to use, easy to operate, and compatible with existing packet units. Our new hardware design also includes features not found on other packet controllers, including a 1200 baud radio modem, and both Bell 103 and 202 tones.

Suggested Retail $219 —



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- Both AX.25 and Vancouver protocols included
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THE TAPR "AD".

Continued from page 3.

Now, I appreciate that TAPR is a non-profit business, but I don't see any exemption for such in 97.110. I think that means that the rule was not intended to limit just profit-oriented businesses from using ham radio to circumvent commercial communication services to send their messages, but was intended to apply to all businesses. The purposes of TAPR may not include making a profit for distribution to shareholders, but they are in business as the term is commonly used. They are offering a product for sale, just like Hamtronics, AEA, Heath,...

The second part that seems to nail it down is in para 97.114, relative to third party traffic, which is what the ad appeared to be:

a) International third party traffic...

b) Third party traffic involving material compensation, either tangible or intangible, direct or indirect, to a third party, a station licensee, a control operator, or any other person.

c) Except for an emergency communication as defined in this Part, third-party traffic consisting of business communications on behalf of any party.

This too appears to me to mean that the ad was against the rules. It pretty plainly involved material compensation. The prices and ordering information were plainly given. TAPR stood to gain from the sale of the TNCs. It was on behalf of a business.

That is my case for saying that the message should not have been passed via amateur radio. I would certainly be open to arguments which take the other side of the question. Of more concern, though, is the more basic question of how to help the operators of the bulletin boards maintain their services without having to act as lonely consors upon their fellow Amateurs. That is the way to create hard feelings and misunderstandings. I don't want the FCC to feel that they have to step in and create blanket prohibitions against bulletin boards because there is a lack of self-regulation by the amateur community.

There is a strong prescedent in the recent position by the FCC regarding coordinated repeaters. A repeater which did operate on a frequency pair which had not been coordinated by the amateur repeater coordinating body for that area would be deemed to be in violation of the interference rules if it interfered with a coordinated repeater on the same frequency. I want to see the same sort of thing apply in packet radio. If we, the amateur packet community, act to establish reasonable guidelines for the use and application of the bulletin boards and mailbox systems, then when and if there is a problem, the FCC will have good reason to regard it as an individual problem rather than a general need for rule-making.

So let's have the debate about TAPR, with due regard for the right of everyone to be heard and to be honestly in opposition to one's own opinions. That will help to focus and sensitize the packet community to a problem which has been creeping up on us since the bulletin boards went on the air. But let's follow the debate by establishing some guidelines and standards for the help and advice of the bulletin board operators regarding what is allowable. After all, if things get bad and the FCC steps in, all most of us will lose will be the use of the bulletin boards. The operators could lose their tickets.

73, Dave, K1MBO

RS-232 INTERFACING

Jim Diggs, K4AHO

One of the more difficult steps in getting started in packet radio is getting the interface between the TNC and the terminal to work properly. This interface is usually the industry standard RS-232. It is not a difficult interface to use if broken down into manageable steps. There are three types of signals in the normal interface but only one is absolutely necessary.

1. Data transfer signals.
2. Hardwired handshaking signals.
3. Status signals.

The data transfer lines (pins 2 and 3) transfer data from one device to another. There are only two types of devices on a RS-232 interface, a DTE and a DCE. A DTE is a data terminal device and can be a dumb terminal or a computer operating as a smart terminal. A DTE has its outgoing data on pin 2 and incoming data on pin 3. A DCE is a data communications device and can be a telephone modem or a radio modem like the TNC. A DCE has its incoming data on pin 2 and outgoing data on pin 3. This is opposite of a DTE, which allows a pin for pin connection between a DTE and a DCE. Two devices of the same type (DTE to DTE or DCE to DCE) can talk together with a interface cable known as a "Null Modem" cable. The cable is unique as pin 2 and pin 3 are cross wired to maintain proper direction of data flow. The return for the data signals is pin 7 although pin 1 can be used. An interface using only pin 2, 3 and 7 is known as a 3 wire interface.

Electrically the RS-232 standard has two possible conditions; a logical "0" which is a negative voltage (more negative than -3 volts) and a logical "1" is a positive voltage (more positive than +3 volts). Some TNC's and computers use 0 volts and 5 or 12 volts for logical 0 and logical 1. Generally this interface is not compatable with a true RS-232 interface and must be converted, ie. the Commodore C64 and its RS-232 adapter.

Handshaking is the next but less essential function of the RS-232 standard. The handshake is a stopping and starting of data flow from DTE to DCE to prevent TNC transmit buffer overflow. Software handshaking can be achieved by using a control-Q and a control-S as a start and stop signal to control the transfer of data. Hardwired handshake uses the RTS (request to send) and CTS (clear to send) signals to control the flow of data. The DTE (terminal) uses the RTS line to tell the DCE (modem) it is ready to send data. The DCE responds with a true (logic 1) CTS signal telling the DTE to send data. The CTS signal from the DCE is also called the busy signal. The DCE sets the CTS to a logic"0" when it cannot accept more data. This condition happens when the TNC transmit buffer fills because of a long path and many retries. Otherwise the data will be lost as the TNC buffer overflows. A DTE (terminal) has RTS on pin 4 as an output and CTS on pin 5 as an input. A DCE (modem or TNC) has RTS on pin 4 as an input and CTS on pin 5 as an output. Normal DTE to DCE cables will have RTS and CTS wired pin for pin. Null modems cables will be crossed wired. Handshaking, either software or hardwired, is necessary when transfering files by packet radio.

The third class of RS-232 signals are the status signals. These signals are the least necessary but can cause the most problems if required. The three status signals are pin 6 Data Set Ready (DSR), pin 8 Data Carrier Detect (DCD), and pin 20 Data Terminal Ready (DTR). The DSR is a signal from the DCE to the DTE indicating that the DCE is present and ready for data transfer. The DCD indicates that the DCE has received a carrier from the telephone line, but is not used for packet operation. The DTR is a signal from the DTE to the DCE indicating the DTE is also ready for data transfer. These status signals can be handled two ways. The DTR (pin 20), DSR (pin6) and the DCD (pin 8) can be connected pin for pin. An easier way is to loop the status signals back on the DB25 plug at each device, satisfing its own status signal requirements.

The cable should be wired as follows:

```
pin 1  ----------------------  pin 1
pin 2  ----------------------  pin 2
pin 3  ----------------------  pin 3
pin 4  ----------------------  pin 4
pin 5  ----------------------  pin 5
pin 6  ---!              !---  pin 6
pin 8  ---!              !---  pin 8
pin 20 ---!              !---  pin 20
pin 7  ----------------------  pin 7
```

For the Commodore C64 I strongly recomend the Omnitronics RS-232 adapter. It implements a true RS-232 interface and allows true hardwired hankshaking using the RTS pin 5 of the TNC.

M 20895 ANDY FREEBORN (NOCCZ,2983)
9/ 5/85 8:58 AM L:5
KEYS:/NEW COLORADO WORLI GATEWAY/
TO: (Group 95)

The KOHOA (Dave Shavey) Gateway, Colorado Springs, is now fully operational (14.103 mhz). Full WORLI service including message forwarding is available 24hr/day.

Andy

NETWORKING

Jack Brindle, WA4FIB.

Now that we know what the layer two protocol looks like, we will explain what it does. The Data Link layer gets and feeds data from and to the "bit pipe" below it. It also sends data to or gets data from the next upper layer.

The next upper layer uses the data is sees to perform its functions.

There are two different layers that may be placed directly above the Data Link layer, depending on the design of the system. In network systems with true packet relaying and routing, the network layer (layer 3) resides above layer 2. However, there is a type of system, called point-to-point, where each end user establishes a direct connection to other stations with whom he wishes to communicate. The system has no need for the Network or Transport layers since networking is not allowed in its design. Thus we have layer 5, the Session layer, residing atop the Link layer in this system. Point-to-point systems are not handicapped by not having these two layers, in fact a very small amount of time is saved by eliminating the processing required by the two layers. Point-to-point systems do require direct connections for every user pair they serve. In land based systems this means that each node must have a wire-line connection to each other node it talks to, and it must support these connections with hardware interfaces. This does give the advantage of speedy packet delivery, since there are no intervening nodes to slow delivery. Network systems reduce the hardware interface requirements at the expense of layers 3 and 4 processing and slowed throughput due to each node in the path handling the packet.

Each system type has its use in communications. For users requiring very fast data throughput (to drive a high-speed printer, for example), the point-to-point system provides optimum performance. Systems with a large number of end users which can talk to any other user require true networking to reduce the number of direct paths, and allow for more efficient utilization of system resources. The type of system required is decided by the needs of the users.

In amateur packeting, we currently have a slightly modified point-to-point system. Each user must be in direct contact with the station he is speaking to. This is indicated by the "to" and "from" call fields in the Link layer header. In every packet QSO, we place the station we are talking to as the destination and our own call as the source. The digipeater fields allow for an extension of distance, but they still leave the system as point-to-point since they perform no active function other than simply retransmitting packets presented to them. This system works quite well for the limited use we have given it. It does handicap us in communicating over long distances, however, because of the limitation of eight digipeater fields.

The operation of true network systems will look different from our current system. The most obvious will be the presence of the network layer to handle routing and control of services within the network. There will be changes at the Link layer as well. First, in networking we will no longer directly connect to the destination station. We will connect to the local network node, and then request a connection to another station. This request will be a layer 3 function. The entire function of the Link layer will then be to get data from your station to the local network node. The digipeater fields would be used if the network node is out of range of your station. However, they are not a part of the network. The network will act on the destination connect request (the station you wish to talk to) by first finding where the station is located, and then establishing a "virtual connection" (or using an existing one) to the network node that is local to the destination station. Internally, the network uses layer 2 connections to talk from each node to the next. Layer 3 is used to convey commands and status to be used in routing and controlling the packets within the system.

Both these layers communicate only from one node to the next. This means that a node can control the nodes that surround it, but must request those nodes to perform some command to control further nodes.

Let's return to our example. The user has connected to the network, and has requested a connection to another station. The local node determines the path needed to reach the destination, and connects to the next node in the path. In reality, the network layer 2 connections will be permanent so that a node simply uses a connection without having to establish it. This may also be true for the layer 3 connections, more on this in later discussions. The local node then sends the end-user request to the next node, with an identifier that tells the receiving node which path to send the packet out. The packet will be relayed in similar manner until it gets to the destination node, where a layer 2 connection will be established with the desired end user. The two end stations are then free to carry on their conversation. When they are finished, they signal the network to break down the connection. It will then terminate the user sessions and return to a "ready" state.

We can now begin to see where packet networking is heading. There are some problems, though. First is a lack of agreement on the layer 3 protocol definition (what each field does). Second is the fact that this protocol is not implimented in any TNC! Thus something must be done to ease the packet community into networking. Present thoughts are to provide a "gateway" function in each local node so that present TNCs can simply connect to the network and use its facilities for the layer 3 and above functions. We will return to these ideas in later discussions.

CONNECT - The Beginners' Column

Don Deem, KB4LLO

When I first discussed this column with Gwyn, I set forth some goals, one of which was to keep each article primarily of interest to beginners. And not just Florida packeteers, beginners everywhere. In a way this offering may break that goal, but if the non-Florida reader will forgive me in this instance, he or she may find that their area may face a similiar situation in the near future and can benefit from the discussion. Better yet, you may have faced what lies before us and you have solutions. If so please write !

As everyone knows, packet is growing at an amazing rate, and as a result we are beginning to experience some growing pains. Some of those pains were discussed on the 75-meter net this morning (8/25). I must say that I was surprised and somewhat disappointed to find the discussion so heated and the packeteers so divided. The subject was the MailBox systems that we are presently using. I personally became involved in this issue some weeks ago when someone mentioned to me that they were unable to use their packet system due to the continuous MailBox activity on 145.01 mhz, and as a result were shutting down. I began to monitor

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In the Tampa LAN, Mailbox channel occupancy has been minimized by the wise operation of the SYSOP.

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my own station to determine the extent of the problem. After two weeks of monitoring I found that from early morning until 1600 hrs, activity is primarily limited to unattended beacons and MailBox automatic updates. From 1600 hrs to Midnight appears to be the prime time for packeting. From 0000 to early morning, unattended beacons and MailBox updates. This was the observation at my location, but I suspect it is representative of activity patterns all over the state.

Shortly thereafter I was able to attend our Tampa LAN meeting, and MailBoxes were again a major topic. The Naples 220 linking meeting was driven by the need to reduce loading on the 2 meter network. It was at this point that I realized the strong feelings that become evident when the discussion turns to our WORLI systems.

As a beginner (an INTERESTED beginner) the problem seems to have a simple, quick solution. In the Tampa LAN, MailBox channel occupancy has been minimized by the wise operation of the SYSOP (KF4EF). Pat restricts his system's automatic updating to the period from 0000 to 0600. He also spends quite a lot of time educating those of us who use the system. Education is as important to FADCA as a well run MailBox system; think about that.

Question: how do we solve the immediate congestion problem ? My personal feeling is that we follow KF4EF's lead and find update times

that interfere with other activities the least, including non-local network users. At the same time continue to educate persons how to properly utilize the MailBox system to minimize air time. Isn't it worth a try?

Another heated topic was that of BEACONS. The statement was something like, "I wonder if the people who complain about MailBox interference are the ones who beacon all the time?" I don't think that individual really meant for his statement to sound as it did, we all sometimes engage mouth before brain and make statements that sound harsh without meaning to.I'm sure that was the case this morning. I recall a statement that Gwyn made once, "we don't all get the same thing out of packet, some like file transfers, some DXing, and some enjoy keyboard QSOs, etc. We must remember that we are all packeteers and have equal right to enjoy our hobby". (Close enough, Gwyn?) Beacons serve me several ways. First they give me a clue to propagation, to find where can I talk easily. Secondly, if I see a beacon I may have found someone to converse with. I must admit that I find beacons from unattended stations difficult to understand or justify. Basically, the beacon helps the beginner develop his packet skills through conversations with other beginners and interested people.We must remember that some of our membership have no interest in computers and their use except to make possible packet operation.

If you as an individual have any comments or suggestions concerning the MailBoxes and BBSs and their operation, drop me a line or connect to my via KC2FF-7. Better yet, write a letter to the BEACON editor for publication. I strongly suggest that you should not knock the system until you familiarize yourself with its usefulness. One more thing, I certainly hope that we don't let this matter be blown out of proportion to its importance. Remember as long as we are unified we can solve any problem, but if we are splintered into special interest groups will prevent any solution.

73....

LOW SPEED LINKING

Continued from page 2.

An alternative I favor is to use Manchester modulation, which does not require such a low frequency corner. It's disadvantage is that the data rate is halved, and our system will likely end up somewhere between 2400 and 4800 bps. The scheme has the advantage however, that the modem simplfies considerably. The Z8530 chip can run Manchester, and no data randomizer or clock recovery circuit is required. WA4FIB has used the Z8530 chip in the Manchester mode on the air with good results. K6SOX reports good results with it at 4800 bps. If the IC-37A PLL corner frequency can be raised for Manchester modulation, the T/R switching time may then be decreased. I would appreciate any comments on this approach.

NO MOD HF PACKET

J.W. GREGORY, W4QF

HF packet is easily accomplished with the TNC-1 or HD-4040, without modification, by utilizing the excellent FADCA modem kit*.

1) Construct and align the FADCA modem kit, following the FADCA manual instructions, for 300 baud, 200Hz shift use.

2) Locate J5 on the TNC board. All pins remain jumpered as they are except pins 1-2, 17-18, and 19-20. Heath has a plug available to fit J5 (part #134-1497, $14.40). If this plug is used, jumper all pins as they were (on the cable attached to the Heath plug) except those pins previously mentioned. Wire remaining leads to switch as shown below.

3) Mount 3PDT switch (R/S#275-661) and FADCA modem in a suitable box.

4) See switch wiring diagram below. Switch selects either HF or VHF packet operation.

5) With all units off, make connections to J5, transceivers, etc. Use TNC PTT jack for PTT function.

6) For HF operation, power up TNC and modem. Turn switch to HF position. Type "H 300". Initialize TNC HDLC with a "C X" command, then "D" disconnect.

7) Many different BELL 103 tone pairs are currently in use on HF packet - 1600/1800 (TAPR), 1070-1270 (FADCA modem), 2025-2225 (Kantronics), etc. It really doesn't matter which tone pairs are used as long as the shift is correct (currently 200Hz). Thus, all one has to do is offset one's tuning to match incoming tones to TNC tones in use. This is much easier than it sounds. Example: For the popular 20 meter frequency, 14103 - FADCA modem tuning will be about 14102.4, LSB. Of course, the easy way is to use some form of tuning indicator by adapting a unit such as the one described in PSR, June 1984. HF packet is great fun. Hope to see you there.

THE JUNKBOX

FADCA has 8530-A SCC chips which are used on the FADboard with the Xerox 820 to give a dual HDLC output. These are high speed 6 MHz parts. Only $20.00 postpaid.

The FADCA modem kit provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. The price is $8.95 postpaid from the designer and producer:

Jerry Quimby (N4AJH)
601 Verbenia Drive
Satellite Beach, FL 32937

FADCA badges are now available. Badges are 2 1/4" round with locking pin on backside. $1.00 without call letters, $2.00 with. Colors available are yellow, gold, salmon and blue.

ALL parts are available for the TAPR/AEA/Heath TNC including 1935s and 2212s. Contact Bob Boyce, KB4IQM. (305) 967-9999. (24 hours).

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902 MHz BAND OPENED

(Via Compuserve HamNet)

AUGUST 16, 1985. The FCC has released its long-awaited decision on the allocation of the 902-928 MHz band to the Amateur Radio Service.

The FCC approved the use of this band, secondary to operation of government stations, automatic vehicle monitoring systems and industrial, scientific and medical devices.

The band may be used by all hams above Novice class. Emissions permitted are NON, A1A, A2A, A2B, A3E, A3C, A3F, F1B, F2B, F3E, G3E, F3C, F3F, F8E and P0N.

A couple of significant restrictions apply. First, operation in the band is not permitted in Colorado and Wyoming, bounded by the area of latitude 39 to 42 N and longitude 103 W to 108 W. The FCC noted that there are government stations in those areas that must be protected. However, it said that it expects those stations to move within a year, at which time it will delete the prohibition on amateur operation there.

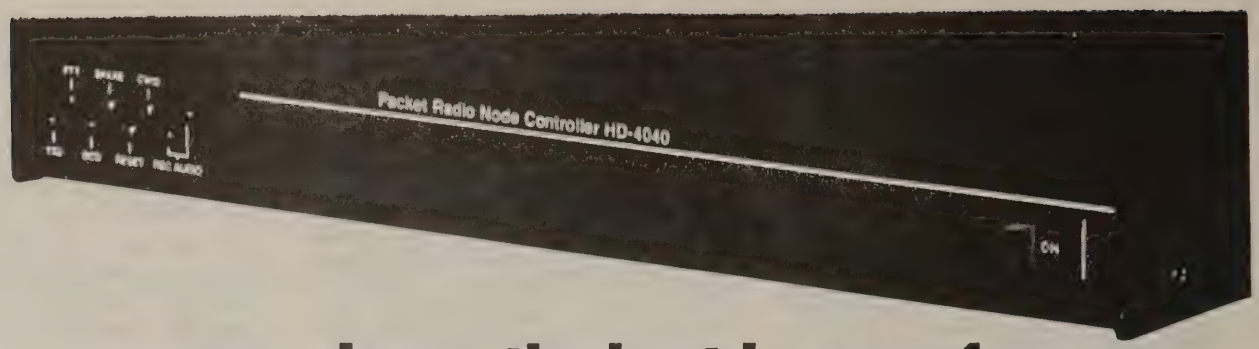
Also, operation in the band is not permitted within a certain area of Texas and New Mexico in the vicinity of White Sands Missile Range. Outside this area, but within 150 miles of its boundaries, amateurs may operate with a maximum peak envelope power of 50 watts. The Army has operations that include "tracking and control of unmanned aircraft" that use the band.

The FCC declined to adopt proposals made by personal radio organizations to establish a new personal radio service in a portion of the 902-928 MHz band. The agency said, "It appears that a secondary personal communications service could receive considerable harmful interference to current primary government military radiolocation uses."

However, the FCC noted that it has several pending proceedings concerning a new personal radio service, and that it did not by its action here "intend to prejudge" those matters.

Several manufacturers of RF devices (including a personal computer peripherals maker) objected to the allocation of the band to amateur radio on the grounds that amateur transmissions would interfere with various products such as wireless video monitors and alarm devices. The FCC replied that such devices "must tolerate interference from operation in any radio service, whether it is listed as primary or secondary in the Table of Allocations."

SLAPR is moving its Packet Frequency from 147.555 MHZ to 145.01. This change has been coordinated in Eastern Missouri and Southern Illinois. Our coordination agreement states that the move will be complete by October 15th.



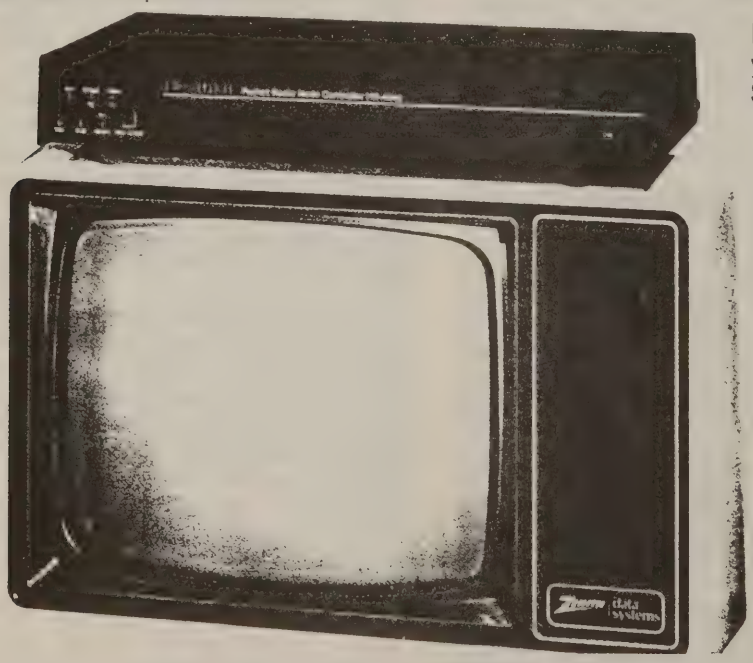
Now you can experience the best in error-free packet radio transmission with Heath's new HD-4040 Terminal Node Controller Kit

The only news more exciting than packet radio is the Heath Terminal Node Controller because it represents the best in packet radio equipment. In fact, it's the only RFI approved, FCC certified terminal node controller available. Designed in the Heath tradition of quality and affordability, the HD-4040 is the best equipment at the best price.

A version of the popular Tucson Amateur Packet Radio (TAPR), the Heath TNC combines computer technology with Amateur Radio to open up the world of packet radio and its countless applications. Just type in your messages on the keyboard of a terminal or computer and the Heath Terminal Node Controller does the rest. It allows you to run your station more efficiently and with more activity and variety of uses than were ever possible before.

With Heath's TNC you can: send messages at speeds up to 1200 baud or higher; extend your station's range by relaying transmissions through up to eight stations; leave a message at a friend's shack; automatically transmit your call letters and a message; converse via satellite; receive computer programs; participate in bulletin boards and more. All error-free, fast and without worries about QRM.

The Heath TNC Kit features built-in quality. It has an integral 1200 baud modem and extended baud rates up to 19,600 using an external modem and optional clock. It also has an automatic beacon, digital repeater, RS-232C serial port, parallel port, and eight operational lights for complete TNC status at a glance. The TNC comes with Heath's well-known and well-illustrated step-by-step assembly manual.



Experience packet radio communication yourself at the Heath Hamvention booth. See why packet radio is changing the future of Amateur Radio...and how Heath is leading the way with its quality packet radio equipment.

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W5YI REPORT

(The following two items are from the W5YI Report)

ARRL Approves Band Plan October '84

The following interim band plan has already been adopted by the ARRL Board of Directors:

902-928 MHz BAND PLAN

902-904 Narrow Band Weak Signal
- 902.0-.8 SSTV, FAX, ACSB, Experimental
- 902.8-903.0 EME, CW Expansion
- 903.0-.05 EME (Earth-Moon-Earth)
- 903.07-.08 CW Beacons
- 903.1 CW, SSB Calling Frequency
- 903.4-.6 Crossband Linear Translator Inputs
- 903.6-.8 Crossband Linear Translator Outputs
- 903.8-904.0 Experimental Beacons

904-906 Digital Communications
906-907 Narrow-Band FM simplex channels every 25 kHz
- 906.5 National Simplex Frequency

907-910 FM Repeater Inputs (119 pairs/25kHz/beginning 907.025)
910-916 Amateur Television
916-918 Digital Communications
918-919 Narrow Band FM Control Links and Remote Bases
919-922 FM Repeater Outputs
922-928 Wide-Band Experimental, Simplex ATV, Spread Spectrum

The band is available to the amateur community effective 0001 UTC, September 28, 1985.

Ham Packet Interest Shuts Down AFB!

Two articles have appeared recently in QST about packet radio... one in the July issue... another in August. If you haven't read them, be certain that you do. Interest in packet radio is reaching a fever pitch! Here's what happened at TAPR, the Tucson Amateur Packet Radio group just a week ago.

The August issue featured the TAPR TNC-2 on the cover as well as an article on it. The TNC... Terminal Node Controller... is the gadget that coverts computer data to audio tones that can be transmitted over amateur radio. "Packet"... as it is now referred to... can be likened to high speed enhanced radio teletype. Through a handshaking system, it is error free, and a single frequency can be shared by several simultaneous conversations.

A packet ham station acts also as a repeater since the station is receiving and transmitting at the same time. Packeteers call them "digipeaters". They allow networking by automatic relay. Communications not intended for your station is simply sent further on down the line.

Packet is fast... up 1440 WPM on VHF and lends itself well to bulletin boards... traffic handling... data banks... electronic mail... even error-free pictures, digitized voice and digital television. This newsletter is [carried] on the packet system. I don't know who puts it there. (We don't copyright anything we do to allow anyone to do anything they wish to with it. All we ask for is a credit line to The W5YI Report.)

In a word, "packet" is exploding on the amateur scene. What happened at TAPR headquarters in Tucson last week is unbelievable! Volunteers had already made plans to help staff the offices. Amateurs from Colorado Springs, Los Angeles... even Washington, DC, flew into Tucson to assist in the office. The TAPR folks knew that their new $185 TNC would be popular. They had no idea of what was in store for them!

On Monday morning, the phones were literally ringing off the hook! Orders for the TNC-2 were pouring in... one after another! At noon, TAPR received a call from one of the Tucson telephone company engineers. It seems the number of calls coming into the state had completely saturated the telephone network!

The switching system in the Tucson area shut down three different times due to the load! Davis Monthan Air Force Base in Tucson could not talk to the outside world! Amateurs calling TAPR had shut down all telephones at the military base! All of the lines and WATS lines in and out of the state were jammed! You could not even get a dial tone.

They knew they would get orders... but they didn't expect to clog the telephone system. It was amusing because the engineer at the telephone office was trying to figure out why this lone little telephone number in a small little office was getting all this attention from not only the United States, but from around the world... Japan... Australia... South Africa... everywhere.

About 650 orders for the TNC-2 were accepted the first 2 days alone! TAPR is already sold out for August and September and they have a whole bunch of tired volunteer order takers. It appears that packet radio has finally reached the average amateur. The volunteers that have worked over the last four years are very gratified.

TNC-2 is the culmination of all of the design work done by TAPR volunteers during the last two years. They wanted to make a unit that was low cost but full functioning using readily available components. TAPR wanted the unit to be small and operate off of 12 volts so that it could be used for emergency communications and traffic handling in a portable situation as well as at home.

The unit has been in testing since just after the Dayton HamVention last April where it was introduced. They had everyone from very technically inclined hams (including Tom Clark, W3IWI, ex-AMSAT prez) to a typical housewife who put it together on the kitchen table to see if the average person could assemble it. TAPR feels that they have met that challenge. The average person can get it together.

The actual making of the kits and getting them out the door is done in Tucson, Arizona. I spoke to their Vice President, Peter Eaton, WB9FLW, this past week but he lives in St. Louis. The software for the unit was done in Florida. The hardware work was done in New Jersey. The modem work was done in Chicago, Pete told me. TAPR is literally a world-wide organization where everybody takes their efforts and energies to try to develop this new digital technology and offer it to the amateur community at a very low price. No one is paid for their efforts.

About 5,000 of the original TNC-1 were sold. TAPR sold about 2,500 of the unit and Heathkit has sold at least 1,500 of the HD-4040... their version of the TAPR TNC-1. Other firms, such as AEA, also have a TAPR TNC-1 unit. TAPR feels that sales of the TNC-2 will far outdistance that of their first model.

Eaton said that packet radio will be to the eighties what 2-meter FM was to the seventies and sideband to the fifties and sixties. The amount of interest being generated clearly shows this. They have a lot of tired people there at the TAPR office. TAPR is a non-profit research and development corporation with only one paid employee... an office girl... Chris.

It was formed only three years ago under IRS-501C status. Their corporate structure is very similar to that of AMSAT. While expenses are reimbursed, no one is paid for their efforts. All engineering work was done gratis so that the amateur community could use this new technology. It is hard for commercial firms to understand TAPR's motivation. They don't even charge a consulting fee when assisting competitors! "We do it purely for the love of it."

What is surprising is that TAPR does not advertise. They have no type of marketing plan whatsoever, but the word got around that the TNC-2 would be available and TAPR has had calls from all over the world. A standing joke at TAPR Tucson is that they had "Worked (Sold) All States" except for Wyoming and Maine. (They did Work All Continents.)

Even the July and August QST articles never mentioned the TNC-2's price... or even their address. (By the way, the magic telephone number is 602-746-1166. Address: PO Box 22888, Tucson, AZ 85734). We think we are the first to publish it and hope that we don't cause them additional problems.

Young people are into computers. Packet radio is the perfect marriage of computers and the amateur radio environment... allowing people to communicate computer to computer. A true computer network exists in amateur radio. Their motto says it all... "Join the packet radio revolution!"

CURT PARRISH,K4TL
Electronic Kit Assembly & Repairs
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So You Want To Try Something New? How 'Bout The AEA Packet Breakthrough!

Because:

You want to recreate the thrill of your first ham contact!
You'd like to learn something new!
You want to send error-free messages on HF/VHF/Satellite in spite of QRM!
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.

In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

```
AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA
   PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:
```

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5–6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

See your favorite AEA dealer, clip and send the coupon, or call John Gates, N7BTI (the AEA Packetman) at (206) 775-7373.

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Zip _____ Call me at _____

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TAPR NETWORK NODE CONTROLLER (NNC) UPDATE

To keep everyone in the loop, here is the present status of the TAPR NNC hardware project.

The schematics are presently in St. Louis at Interconnections, the company that does all the CAD layout work for TAPR. If all goes well, we should have artwork for all three boards by the end of the month!

Three boards???

Board 1 is the NNC itself. Its present configuration is as follows:

1)HD64180 processor. This is the Z80 superset chip with on-chip DMA, CMOS, dual UARTs, 16 bit timers, MMU, clock, etc. Same as featured in September BYTE SB180 project.

2)Dual SIO/2s. This allows four channels of HDLC capability. One SIO may be configured (via push-on jumpers) to have channel A and/or channel B operate DMA.

3)One PIO. This gives a parallel printer port and several lines to fiddle with (for Bells, Whistles, Buzzers and...)

4)...a battery-backed Real Time Clock. The chip in the first cut is the Mostek 3835. Serial interface (via PIO), 8-pin miniDIP, etc. App note enroute from Mostek on ways to reduce current drain from 600 uA.

5)NCR 5380 SCSI interface. This chip may be configured to operate under DMA. Allows this board to be a smart Level Two "front end" for a later board that can handle all the networking, transport and etc when the network outgrows the capacity of the 64180. Also allows multiple 64180s to talk, etc.

6)Eight byte-wide sockets, battery backed, for 6264Ls (allows 64k bytes of bbRAM) with jumper selection for 43256Ls (allows 256k bytes of bbRAM !!).

7)Eight more bytewide sockets mapped for 32k byte parts. Jumper selectable for 27C256s or 43256s. Can use 6264s as well. This allows the full 1/2 megabyte to be put on the board.

8)Expansion interface for Board Three (described below).

This will run on 5-volts DC, has RS-232 compatible ports for the two async UART channels that are part of the 64180. The serial interface is per the WESTLINK paper, with the two unused pins going to the DTR and DCD pins of the SIO/2. TTL levels.

But, you may ask, what good is a NNC without modems? Glad you asked that!

Board Two, to go to St. Louis next week (to give them a reason to not get at Board Three, which is already there) consists of:

1)Multiple XR2206/XR2211 modems. Clock generator and a separate state machine provided for each modem as well as a tuning indicator. Board constraints will determine whether we only get two modems or if we can squeeze four modems per card.

B)Yes these are only 1200 baud (or 300 baud) modems. But, the local users need a port or two to get in (1200 baud) and long-haul stuff is going to be HF for a while to come (300 baud now, 1200 later?).

Both of these boards to be sized per the WESTLINK paper so they can screw on the side of a 5.25" floppy drive.

Why a floppy drive? Glad you asked that!

Board Three is a plug-in floppy disk interface! The I/O is mapped to be compatible with the SB180 to allow a simple port of the "Z" system. Thus, the NNC can become its own software development engine. And, the hard work of the port of a decent (?) operating system is already done and readily available at a reasonable price.

If we are lucky, all boards will be laid out by the end of September. Prototype boards should be populated in October, then debugged by hardware types while the software types (hopefully) will get cranking on some level three stuff.

We're cooking with gas now!

Thank you each and every one for your inputs to date. Keep the comments coming!

Who knows, we may be able to get a December release on these things so all you Networking development types can cranking on some decent, available and CHEAP! hardware in time for Christmas (or Hanukah, as you prefer).

PS - the K9NG modem boards were ready today at the PC house. The hard-to-get capacitors are nearly all in. Jeff Ward and Jon Bloom of the ARRL have really helped a lot on this project, building on the layout done by Chuck Green. The board will have good documentation as a result. It will be supplied with the above-mentioned capacitors and a programmed State Machine EPROM. Expect an announcement on DRNET later in the week for price and availability. Target price is around $20. 100 boards in the first lot.

Happy Packeting! Lyle

HF PACKET VS PROPAGATION

Enclosed is a position paper from Dr. Alan Chandler V.P. Engineering, A.E.A., Inc. concerning some 600 Hz shift experimentation that you, your customers, or club members may be interested in trying. Brett Graham, KB7G of A.E.A. is on 14.103 MHz with both 200 and 600 Hz shift capabilities. You may contact him there, or arrange a schedule via the KF4JF MailBox. We are very interested in your results if you choose to do your own experiments. The A.E.A. PKT-1, TAPR TNC1 and clones configured with the Bell 202 (1200 and 2200 Hz) tones need no modification for 600 Hz operation - merely calibrate the AFSK tones to 1400 & 2000 Hz. In the cal:routine, instead of typing "1" to calibrate the tone for the 1200 Hz, type "1/1317" and adjust R38 for 0000 counts. For the high tone, type "2/922" instead of just "2" and adjust R36 for 0000 counts. Your AFSK generator is now set to 1400 & 2000 and you're ready to go 600 Hz shift HF Packet!

Cheers,
John Gates, N7BTI

600 Hz SHIFT ON HF PACKET

Dr. Alan Chandler PhD, K6RFK
V.P. Engineering, A.E.A., Inc.

The 200 Hz shift that is becoming the defacto standard for 300 baud HF packet has a substantial deficiency when on an ionospheric path. Due to differential path length, both frequencies may be present simultaneously at the receiver and will generate a beat frequency. If the beat frequency is greater than the highest desired harmonic of the data it may be filtered out and will not be a problem. If it is lower, the beat will be treated as data by the TU and will generate errors. In the case of 300 baud data, the fundamental is 150 Hz, and the minimum 3rd harmonic should be passed. This gives minimum shift of 450 Hz and to allow economical filters, the minimum shift should be 600 Hz. The TAPR, and TAPR equivalent modems will receive 600 Hz shift without modification and they can easily be adjusted to transmit 600 Hz shift tones (1400 and 2000 Hz tones).

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REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM. NCS: K4NTA

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 8:30 PM EDT. NCS: KF4EF

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

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FADCA is an organization of people interested in digital communications, especially packet radio. We have grown to over 200 members is just over a year, and are continuing to grow rapidly. FADCA's newsletter, the FADCA BEACON is published monthly and provides highly aclaimed technical and operational information. The technical and editorial content is of interest to members located all over the nation, although much of the operational information is related to Florida and the nearby states that participate in SOUTHNET.

You should join FADCA if you are interested in computers, RTTY, AMTOR, packet, emergency communication, traffic handling, satellite operation, or just keeping up with the new digital frontier of amateur radio. Please complete the application below and send with your dues to the above address. If you would like a sample copy of the FADCA BEACON, send a SASE (39¢) to the FADCA address.

FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

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ARE YOU NOW OPERATING: PACKET? AMTOR: RTTY: OTHER SPECIALIZED MODES?

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_____

A NON-PROFIT ORGANIZATION FOR RESEARCH, DEVELOPMENT, EDUCATION, AND PUBLIC SERVICE.

FROM: paul newland, ad7i
TO: all TNC2 owners
SUBJ: tnc2
DIST: open, please forward
DATE: 85.09.04

Some folks are having trouble bringing up their TNC2 boards. Of those who have had problems, many have found that they have bad 74CH4066 analog switches used as part of the RAM select circuitry. If you are having troubles with your TNC2, try the following:
Remove U13 and place a short from U13 pin 8 to U13 pin 9. If your system now works, you have a bad 74HC4006 and it should be returned to TAPR for replacement. In the meantime, you can use the board as it is but none of the user parameters will be stored if you turn off the power to TNC2. If you want to live dangerously, you can install a CD4066 or a CD4016 at U13. We have found these parts to be OK but the 74HC4066 is a much better part. With the power off U13 gets about 2.7 volts for VCC from the battery, which is fine for the 74HC4066. However, that is outside the recommended operating range of the CD4066. So, if you have it, use the 74HC4066. I don't want to hear any complaints about battery backed up memory not working if you have a CD4066 or CD4016 installed at U13. I offer the suggestion for your convenience. A wire between pins 8 and 9 works great too.

73, paul
P.S. When you get your new 74HC4066, please remember to remove any straps you might have wired to the bottom side of the board from pins 8 to 9.

M 21526 Pete Eaton (WB9FLW,2970)
9/ 7/85 2:58 AM L:26
KEYS:/HEY BUDDY GOT A LATCH?/
To: All
From: Pete WB9FLW
Subject: Hey buddy got a Latch?
Dist: Open (although embarrassing)

Well gang guess what, with all the bad 4066s we had in the first run of kits you would think that would be it right? Wrong! In the last 12 hours no less than five folks have located and replace U5 in their TNC 2, this is a 74HCT374 OCTAL LATCH. This chip is used in the state machine, and can be manifested by failure of the digital loopback test (retry count exceeded ***Disconnected) or just plan silence when the unit should come to life. Now several of these folks have learned A LOT about State Machines in the last couple of days debugging their units so perhaps something good has occured.

If you have any folks complaining of the above symptoms with their kit make a beeline to U5, that might be the fix.

Needless to say if it's bad let TAPR know we will be happy to send a replacement at no charge.

I'm sure Lyle will have a nice "chat" with the fellow we buy IC's from.

Sigh...what a week.

DIGITAL RADIO NET

M 19753 Lyle Johnson (WA7GXD,2973)
9/ 1/85 10:34 PM L:45
KEYS:/TNC 2 PROBLEMS AND FIXES/
KEEP THE REPORTS COMING/
TO: WA7GXD, (Group 95)

NOTICE !
If you have had problems getting your TNC 2 to give the proper power-up sequence, check the power supply voltages. It seems that we received a bad batch of 74HC4066 ICs (U13). These chips must be the 74HC4066 for the bbRAM circuitry to properly funciton. Substituting a standard 4066 chip may allow TNC 2 to funciton, but the battery backed RAM will be liable to forget.

If you have a bad 74HC4066, or suspect you have a bad one, contact the TAPR office and we will send you a new one. We are returning the pieces we have in stock to the manufacturer and changing to a different manufacturer (or at least get a different lot number) to try and cure this problem. If we have to ship to you from the current lot, we will pretest the IC we send on a working TNC 2 to ensure its functionality.

TAPR HAS ALWAYS HAD A POLICY OF REPLACING DEFECTIVE PARTS AND WILL CONTINUE TO OFFER THIS SUPPORT. IF YOU HAVE THIS PROBLEM AND CALL THE OFFICE (WITH YOUR ORDER NUMBER, PLEASE) WE WILL SEND YOU A NEW74HC4066 IC.

If you suffer from interference to your radio gear, try the following:

1) Keep your antenna outside away from any digital gear in the shack. This is always the first step.

2) 29th harmonic of 2.4576 MHz output of divider U4a is 144.9984 MHz. If the crystal is slightly high in frequency (4.9156 Mhz instead of 4.9152 MHz), this spur will fall on 145.010. Solution is to increase the value of C47.

3) Adding a 220 pF capacitor across U4 pins 3 to 7, a 100 pF capacitor across U10 pins 12 to 7, and a 0.01 uF capacitor across U4 pins 6 and 7 will aid in reducing spurious rf.

The October issue of Packet Status Register (TAPR's quarterly publication sent to all members) will have detailed information on TNC 2 based on field experience and lab analysis.

Keep the bug reports coming, and thank you for your support.

M 21612 Lyle Johnson (WA7GXD,2973)
9/ 7/85 12:55 PM L:17
KEYS:/TNC 2 HELP IS ON THE WAY/
TO: (Group 95)

This weekend TAPR is boxing up a CARE package and it will be sent out to every TNC 2 purchaser who has had received a kit.

The package contains a 74HC4066 IC (from a different manufacturer than originally supplied) as well as a four-page Hints and Kinks flyer with instructions on how to test and verify U13 (4066) problems, how to calibrate the modem with an alternate procedure that yields more consistent resluts, how to troubleshoot the state machine to see if it has any problems, how to reduce radiated signals from the board, and what to do when all else fails!

If you are one of those who have had problems, help is on the way! And if you still can't get your unit going, TAPR is implementing a repair shop program. If after you get this package you still have problems, call TAPR for instructions on how to get your unit repaired.

Thank you!

M 20274 ANDY FREEBORN (NOCCZ,2983)
9/ 3/85 8:24 PM L:39
KEYS:/HOW DOES THIS SOUND?/
TO: W1BEL, N2WX, WB9FLW, WA7GXD

Gwyn,

We have not been publishing a newsletter, rather have been relying on our TBBS to "spread the word". With the recent rapid growth in numbers we need to start one.

In view of the outstanding current publications (BEACON, PSR) I see no need for more than a "local interest" type of publication.

We have discussed the feasibility of purchasing FADCA>BEACON in bulk and making our local newsletter an "insert". The BEACON could be shipped to us in bulk and we would do the insert, addressing and mailing.

I suspect that some other local packet clubs might be interested in a similar arrangement. The quality of newsletters seems to ebb & flow (mostly ebb) with the comings/goings, enthusiasm and talent of the local editors.

If such an arrangement would have any appeal to you, it seems the major matter to be addressed would be pricing of bulk distribution. FADCA needs to be adequately recompensed (also considering that some local members are FADCA members) and local clubs need to be able to maintain dues costs that will provide the wherewithal to defray upcoming packet linking costs.

The great benefit to be obtained is that the "revolution" will be given a considerable boost by keeping the ever increasing numbers of packeteers better informed.

Andy

FADCA>BEACON

The FADCA>BEACON is published monthly by the Florida Amateur Digital Communications Association, Inc. (FADCA), 812 Childers Loop, Brandon, FL 33511.

Publisher and Editor - Gwyn Reedy, W1BEL
Layout Editor - Brad Voss, WB8ZPE
Mailing labels - Jim Homan, W4DPH
Postal Expense Support - Phil LaMarche, W9DVM
...And lots of help from many authors. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jack Brindle, WA4FIB — Andy DeMartini, KC2FF
Jim Diggs, K4AHO — Howard Goldstein, N2WX
Ted Huf, K4NTA — Dick Klein, W4PCM
Gwyn Reedy, W1BEL — Bill Whitaker, WD4JKM

Officers:

President - Gwyn Reedy, W1BEL
Executive Vice President - Ted Huf, K4NTA
Secretary - Don Deem, KB4LLO
Treasurer - (vacant)

FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (at least 56 cents) 8 1/2 by 11 inch envelope to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

FADCA>BEACON copies printed:

January 1985	- 590	June 1985	- 500
February 1985	- 580	July 1985	- 600
March 1985	-1000	August 1985	- 600
April 1985	- 500	September 1985	- 600
May 1985	- 500		

Information on advertising space in the FADCA>BEACON can be obtained by writing or calling the FADCA office. A rate and layout card is available on request.

Small classified advertisements for FADCA members will be without charge.

Any material appearing in the FADCA>BEACON may be reprinted in any non-profit amateur publication without further permission if credit is given to the author and the BEACON (including the FADCA address.) Commercial publications should contact the FADCA office to make reprinting arrangements.

The original supply of Volume One (1984) FADCA>BEACON is exhausted. Single issues are available for reproduction and mailing costs of $1.00 per issue, or $8.00 for the entire year (11 issues). [NOTE THE PRICE CHANGE] Send your request to the FADCA address.

The DEADLINE for submissions for the OCTOBER issue of the FADCA > BEACON is SEPTEMBER 30th. Articles should be in final form using a 35 character column width. Authors should request a style sheet from the editor.

DIGITAL EVENTS

OCT 12/13. South Florida ARRL Suncoast Convention in St. Petersburg. Two full days of packet activities. Contact KB4LLO or KC2FF.

OCT 12/13. Treasure Coast Ham/Computerfest at Vero Beach. Contact W2KGV.

NOV 23/24. Second SOUTHNET Packetfest hosted by GRAPES. A great weekend at Georgia Tech in Atlanta. Contact WB2CPV.

NOV 30/DEC 1. Broward Hamfest. Contact K4GFG.

JAN 11/12. Sarasota Hamfest. Contact KB4LLO.

FEB 8/9. Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park. Contact WD4JKM.

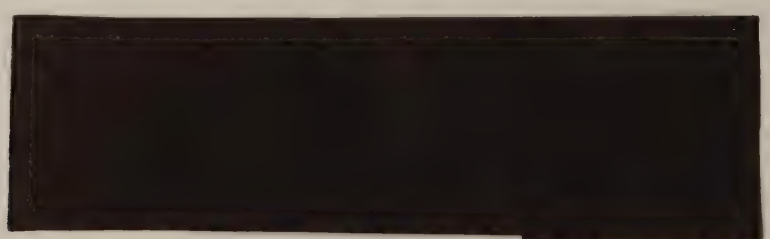
FEB 22. Martin County FREEFEST in Stuart. Contact K4NTA.

MAR 1. Hernando County Hamfest in Brooksville. Contact W1BEL.

MAR Orlando Hamcation. The Third SOUTHNET Packetfest in conjunction with the 5th ARRL Computer Networking Conference. Contact W1BEL or K4AHO.

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

FLORIDA AMATEUR DIGITAL COMMUNICATIONS
ASSOCIATION, INCORPORATED (FADCA)
812 Childers Loop, Brandon, FL 33511



WIN A TNC-2 . . .
DETAILS INSIDE ! !

FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2 No. 10 | Brandon, Florida | October 1985

GLB INTRODUCES PORTABLE TNC

(This is a GLB Electronics Press Release.) The PK1L is unique in terms of small size and low current drain. It is designed for portable use and for digipeater operation under solar or battery operated conditions. Current drain during operation is typically 25 ma, making operation with a 9-volt transistor radio battery even possible. The PK1L also has self-contained "watchdog" and power-down sensing circuits with a lithium battery backup for memory. When power is disconnectred all parameters and modes that have been set up are retained and become available again when power is restored. For remote digipeater operation, in the event of malfunction due to nearby lightning strikes, etc., the watchdog automatically resets the CPU, assuring continued operation for anything short of physical damage to the unit. A "connected" signal is available for use. Spare inputs and outputs are also available for special applications such as with a Bulletin Board System.

The PK1L is a 4.5 x 5.65 inch printed-circuit board, entirely self-contained with an on-board CPU, 8k of memory, preprogrammed 32k ROM, RS-232 interface and packet MODEM. Both connectors are DB-25s, chosen for ready availability. Pinouts were chosen to preclude any damage due to improper insertion. One connector is for transceiver and power supply and the other for a computer, a computer terminal or a teletype machine, either ASCII or Baudot. The CPU is a CMOS Z80A microprocessor operating at 3.58 MHz.

The PK1L communicates to a host computer via an RS232 interface or to a teletype machine with the optional interface module. ASCII or Baudot codes can be used. Host interface transmission rates range from 110 to 9600 baud in ASCII, and up to 100 WPM in Baudot. Below 110 baud the nearest standard teletype rate (60, 75, or 100 wpm) is automatically selected. Terminal baud rate and Baudot/ASCII is selected automatically after power is turned on and after the reset button depressed.

Installation is simple. You need a 9 to 15 volt DC supply, and connections to three points in the transceiver; receiver audio, transmitter audio and push-to-talk. An optional squelch connection to prevent transmission in the presence of a carrier is available. If your computer has an RS-232 jack, all you need is a connecting cable. An interface module is available for RTTY machines and includes a motor control output.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

LIVING TOGETHER.

What is communication? There are many definitions, i.e. it is many things to many people. To radio amateurs it also has many meanings. For instance a QSL card confirms a communication which could have been an hour's ragchew, or the transfer of a callsign and a one or two letter signal report via EME or meteor scatter. Those spending small fortunes of time and money to set up and operate EME stations probably do not appreciate the longwinded chatter that occurs on FM repeaters and 75 meter roundtables. I'm sure the same feelings apply in the opposite direction. Throw in DX chasers, contesters, certificate hunters, etc. and the diversity really shows. The saving grace is that each type of communicator can go to a frequency where people that share his idea of communicating are found. (It isn't really THAT easy, where do you hide during the DX contest, HI.)

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You don't have to agree with the other person's concept of communications, but you do have to honor it.

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We have an increasingly large number of people on packet and they each have their own idea of what worthwhile communication is. On the existing 145.01 network, there has been some disagreement regarding the mailbox systems and the channel loading they generate. That was more than well enough documented in last month's BEACON. My two cents follow.

You don't have to agree with the other person's concept of communications, but you do have to honor it. There aren't any FCC requirements that require meaningful content to amateur communications (and who would judge 'meaningful' anyway?) You do have to share limited spectrum resources with your fellow amateurs. With the exception of emergency traffic, coordinated frequencies and probably a few other cases, frequency sharing is a 'first come, first served' system. Courtesy and good operating practice (aren't they the same?) require that a frequency not be monopolized when no useful communication is taking place. But we are back to deciding what is useful or meaningful communication....

Our beloved packet technology permits multiple persons to use the same frequency at the same time, but there are limits. We have recently been discovering the un-

Continued >>>

BYTES FROM THE WRITE ONLY MEMORY

LIGHTNING

Ted Huf, K4NTA

There is no doubt that lightning should be a serious concern for the ham radio operator, not only from an equipment damage standpoint but also for personal safety. Each year there are approximately 150 deaths and $30,000,000 worth of property damage caused by lightning. Stroke currents of over 340,000 amps have been measured,

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Thus protective measures can be taken allowing a system to survive a 50,000 amp stroke with no damage, and it may receive only minimal damage for a 100,000 amp stroke.

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and potentials of millions of volts have been calculated during lightning strikes. One can only hope the odds of such a strike are so rare that he may never live to see it. The average strike is around 20,000 amps and a million volts.

A cloud to ground lightning discharge, made up of one or more intermittent partial discharges, whose luminous phase is measured in tenths of milliseconds, is called the stroke. There are usually three or four strokes per flash, the strokes being separated by tens of milliseconds. Often lightning as observed by the eye appears to flicker. In these cases the eye distinguishes the individual strokes which make up a flash. Each lightning stroke begins with a weakly luminous predischarge, the leader process, which propagates from cloud to ground and which is followed immediately by a very luminous return stroke which propagates from ground to cloud.

High electrostatic fields are generated during storm activity within the clouds themselves.

Continued on page 3.

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FADCA Nets and Packet Frequencies

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pleasant side of those limits as the available bandwidth (channel capacity) has been exceeded by packeteers communication requirements. Increases in channel capacity will occur and recur as experimentally minded amateurs design and install more advanced networking equipment. But there will NEVER be enough capacity for everyone to do their type of communicating just as they like, when they like.

So let us be patient and tolerant. Each person try to use only his fair share of the channel capacity and do not try to discourage others from using their share as they see fit. What does that really mean? a) persuasion of another to believe as you do is fine, but badmouthing his beliefs is not. b) Its okay to beacon, or connect to yourself via digipeaters, or have DX QSOs, if that is how you want to use up your

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The electronics industry that supports amateur radio is very important to our interests. However, there is no doubt which is the cart and which is the horse...

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share of the channel. However, it doesn't take long to use a bunch of channel if you use several digipeaters or beacon on a frequent basis. c) MailBoxes and BBSs perform a useful service and their channel use is apportioned among all their users. These systems, however, are not entitled to rights and privleges greater than any other communication method. d) We are all neighbors on this network, and no matter how large and fancy it gets, we will have to all be good neighbors if we want it to be a 'great way to communicate.'

Lets focus our energies on planning, developing and installing a bigger, faster network. When there is a bigger network pie to share, each person's slice will be more satisfying.

GROWING UP WITH PACKET

I guess I'm getting old. It must be that because I'm starting to sound like my father did when I was a kid. "Things sure aren't like they used to be," and such statements. Thats the way it is in packet radio. All those years of trying to get people interested with very modest results, and now packet is popular and growing like wildfire. It reminds me of the quip, 'if you got what you asked for, would you really want it?' I was certainly not one of the earliest packeteers, but I fondly remember the earlier days of my packet beginnings when it was all experimental. I don't really want to go back, mind you, but it was very different.

Popularity brings 'bigness' and it manifests itself in many ways. You no longer know every callsign and name on the local network. Previously commonly accepted operating practices are no longer followed. Those things can be easily accepted. What is less comfortable is the arrival of the business interests. The electronic industry that supports amateur radio is very important to our interests. However, there is no doubt which is the cart and which the horse, and there is only one acceptable sequence for those elements to follow. We amateurs are not here to keep them in business, but it is important that we DO keep them in business. Two items that have caused me considerable concern are the recent Kantronics advertising campaign and the Computer Trader Magazine Packet Sweepstakes contest.

The Kantronics ads compare the KPC to the TNC2 in a negative fashion. It isn't that there is any specific misstatement of fact, but... I was always taught (and still believe) that you should do a good job, let people see what you have done, and let your accomplishments speak for themselves. It is poor taste to make yourself (or your product) look better by putting down another. That is my old fashioned attitude showing through. By the way, I own a Kantronics Packet Communicator, I like it, and I purchased it based on its merits (HF modem). I have enjoyed meeting several of the Kantronics officers at various hamfests. I just don't want anyone to generate divisive feelings within amateur radio, especially for marketing purposes.

The Computer Trader Magazine October issue came in the mail yesterday. Page 5 is a full page advertisement for the CTM Packet Sweepstakes with many big-time prizes. There are only hints as to the nature of the contest-a packet Worked All States, and a packet

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Leadership and initiative in the packet movement are gradually passing away from the experimenters and organizers and into the hands of the businessmen.

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DXCC is what it looks like. CTM has been republishing a number of FADCA>BEACON articles and I have been pleased by the exposure for our group. Jim Griffith, WD5RAX, has been doing an excellent job with his CTM Packet Beacon column each month. But the contest advertisement left me very uneasy, and I have finally decided what is bothering me.

Leadership and initiative in the packet movement are gradually passing away from the experimenters and organizers and into the hands of the businessmen. As that happens, the special charm that separated packet from more established ham radio pursuits begins to fade. There is nothing wrong in what is going on, but it is a bit sad. Rather like the passing of the early days of the microcomputer. The charm and excitement are not there any longer; they have been displaced by the sounds of coins. They've even robbed the meaning of the word 'hacker.' Its tough to grow old!

COMING EVENTS

Several exciting events are coming up in the near future. The second SOUTHNET Packet Conference (SOUTHNET II) is less than two months away. Put on this time by the GRAPES bunch (pun intended) at Georgia Tech, it promises to be another great get-together. It is the weekend prior to Thanksgiving, so try to work your schedule to allow you to attend. Long distance drivers-bring along a carload of people from your area. If you have interesting things going on in your area, notify WB2CPV and arrange to make a presentation at the event.

In March, the Fifth ARRL Computer Networking Conference will be held in conjunction with the Third SOUTHNET Conference at the Orlando Hamfest. This will be an opportunity for SOUTHNET packeteers to hear presentations by and meet the nation's packet researchers, developers and implementers. FADCA has been seeking to host the conference for over a year, and we plan to make this an event to remember. Serious volunteers are needed to help plan and manage this event.

BEACON STATISTICS

There have been no complaints about the third class distribution of the September BEACON. That is good news, since financial considerations mandate continuation of that practice. A byproduct of the USPS required sorting of the BEACONS was the generation of distribution statistics.

Total mailing: 361

USA	357	Three or less to:
FL	244	
GA	13	AL AR AZ CO CT KS
AL	9	
NY	8	LA MS NC NH NM OK
CA	7	
NJ	7	OR PA TX UT VA WA
OH	6	
MI	5	
IL,MA,SC,TN	4 each	

Andy Clark, W4IYT, publisher of FLORIDA SKIP, has a new edition of the Florida Traffic Handler's Routing Guide. The booklet was edited and updated by Ron Mettler, WB4GHU. The booklet is full of valuable information for the traffic handler, and for all Florida amateurs. Every city, berg, grove, and wide spot in the road is listed. Included is the Zip code, county, distance and direction from a reference city (one large enough to be on a map), and whether a telephone call from the reference city is toll or local. Also, in the back is a table listing the cities that are in the local call area of each reference city. Very handy. Only $5 from Florida Skip, PO Box 501, Miami Springs, FL 33166.

AMRAD NEWSLETTER

The Amateur Radio Research and Development Corp (AMRAD) publishes a monthly newsletter that covers packet radio and a number of other interesting amateur topics. The publication centers tightly about events and thinking in the DC/MD/VA area, but then so does the Washington Post, and that is called a 'great' newspaper. The August AMRAD newsletter is devoted to the Xerox 820-1 and is full of useful information. I recommend the publication to serious experimenters.

WRITE ONLY MEMORY

Continued from page 1

These fields cause electron flow from top to bottom of clouds. This discharge period occurs in very short steps of less than one microsecond (uS) length and at a recurring interval of 50 uS. This activity builds corona leaders which extend below the base of the cloud towards the ground. As the leader approaches the ground, its large negative charge induces a positive charge on objects below it on the ground, especially objects above the earth. This in return attracts the leader toward the ground positive potential and creates streamer corona upward from the ground objects. When these corona leaders reach a close enough distance, breakdown occurs and a large discharge current from the ground to cloud occurs called a return stroke. This follows the original leader path and results in high electric current flow. Maximum current flow is reached in less than 1 uS and lasts for approxmately 20 uS. A smaller current maintains the stroke path for periods extending over 100 uS.

The return stroke current usually causes damage. Currents, of course, vary depending on the size of the clouds. Experimental data indicates a probability of 90% that the current will be less than 10,000 amps, 8% as high as 60,000 amps and 2% as high as 150,000 amps. Thus protective measures can be taken allowing a system to survive a 50,000 amps stroke with no damage, and it may receive only minimal damage for a 100,000 amp stroke.

Let's examine what happens when lightning strikes a 400 foot tower. Current is going to flow from the ground to tower by what ever path it can find. If it is a 100,000 amp stroke it is going to flow through various paths with most of the current following the path of least resistance. These current flow paths could include tower parts, guy anchors, downlead cables, and through electronic equipment into the power line ground. A 400 foot tower has approximately 150 micro henrys (uH) of inductance. This causes an initial inductive voltage build-up lasting for a little more that 1 uS at the top of the tower. For a 100,000 amp stroke, this short voltage peak calculates out to about 7.8 million volts. For the rest of the stroke period, the voltage drop is developed by the total resistance of the ground. If this value were .5 ohm then there would be an IR drop of 50,000 volts. In this case if a downlead to a radio at the base of the tower had no DC return on its center conductor, after the initial kick some portion of this 50,000 volt drop would exist between the center conductor and shield. This, of course, would cause arc over. If a DC return was connected, the center conductor would eventually share some portion of the 100,000 amp current but might be saved from the arc over. This would speak highly for a DC grounded antenna.

Once one is convinced that stroke current is going to flow through whatever paths it can find, it makes sense to furnish this charge with a controlled low resistance path to conduct a high percentage of the current.

Good grounding of a ham station need not be difficult or very expensive. All of the components are available locally. Use 5/8" copper coated steel ground rods at least 10 feet long. You can also use your well casing if you have one. Use a heavy battery cable to bypass the bearings on rotors by jumpering around the rotor from the mast to the tower. Install feed lines inside of the tower. This will help protect them from side flashes and prevent electromagnetic fields from being induced into the feed lines.

It is very important to have all of the grounds used at your station bonded together. Consider the following: The tower is grounded with a 10 foot ground rod, transceiver grounded with a rod outside the shack, and of course the power company ground at the electrical service meter. Now suppose that lightning hits your tower with a stroke of 10,000 amps. Your tower is grounded, but lets say that it is 10 ohms resistance to earth (pretty good for Florida). The IR drop is 10,000 amps X 10 ohms = 100,000 volts. Some of the current will go to ground, but some will head for the shack on the feed line. Now a couple of things will happen; part of the current goes to ground at the shack ground rod, but some might flash over from the chassis to the power lines to get to the power companies good ground system. The current that was passing on the shield of the coax feed line can also induce a voltage onto the center conductor which then might get into the RF section of your solid state transceiver.

The idea of bonding all the grounds together is to give the current a controlled low resistance path to ground. Lightning will try its best to get to ground so give it a good path. Use #6 or larger solid copper ground wire. Be sure that you make good electrical connections.

A ground rod in the earth's surface sees an electrical resistance from the earth itself. Large surges of current into a rod results in large voltages at a ground rod. Likewise a voltage gradient during a strike exists along the surface of the earth radially around the ground rod. This gradient can be several thousand volts per meter within a few meter radius of the rod. It is therefore not advisable to drive ground rods too close to other grounds WITHOUT bonding to them. This bonding keeps the rods at the same voltage thus reducing flash over.

CURT PARRISH,K4TL
Electronic Kit Assembly & Repairs
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Melborne, Florida 32901
(305) 723-8659

TUNING THE FADCA MODEM

Larry Phelps, K4OZS

The following procedure can be used to adjust the demodulator section of the FADCA Modem if the frequency counter available is not sensitive enough to properly adjust the VCO frequency. The equipment required is the frequency counter, an oscilloscope, and a TTL square-wave generator. The first step is to complete the tuning procedure for the modulator section as outlined in the manual. Next, connect the audio output from the modulator to the audio input of the demodulator. Adjust the TTL square-wave generator for a frequency of 600Hz. This corresponds to a period of 1.66mS, and can be set using the oscilloscope. This output will provide symmetrical bit periods of 0.83mS to the modulator, which corresponds to one bit period at 1200 baud. The oscilloscope should be used to verify that the period for each transistion of the TTL waveform is 0.83mS . Connect the oscilloscope to the TTL data out from the demodulator and simply adjust R19 (the demodulator frequency adjust) for a square wave that has the same period as the input TTL waveform. IF your TTL generator does not have a symmetrical square-wave output (few do), then adjust the demodulator to provide an output that corresponds in symmetry to the input TTL waveform. If desired, capacitor C7 may be selected at this time to minimize loop jitter. I found that a capacitance of 0.0033uF was necessary to minimize jitter in the PLL. This procedure requires more test equipment, but relaxes the requirement for a sensitive frequency counter and allows observation of the performance of your demodulator.

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM. NCS: K4NTA

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 8:30 PM EDT. NCS: KF4EF

BREVARD COUNTY AREA: 146.940 (-600) Sunday 8 PM unless Space Shuttle audio is being broadcast.

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

Florida (and most of SOUTHNET) Packet Frequencies

LAN and calling freq: 145.010

Local QSOs & file xfers: 145.030 /050 /070 /090

220 LANs (20 KHz bandwidth): 221.720, 221.780

Narrow bandwidth linking: 221.400 (20 KHz b/w)

Medium bandwidth linking : 220.570 (100 KHz b/w)

Kantronics

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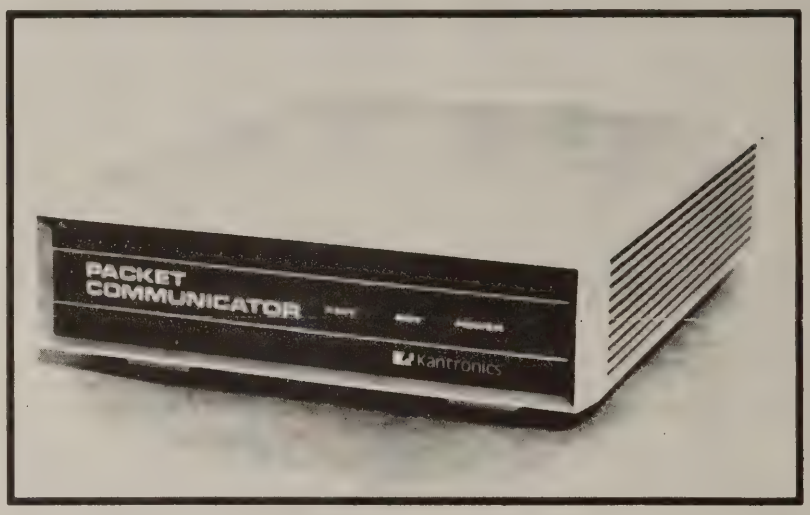

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BEGINNER.DOC

Pat Shaughnessy, KF4EF

Do you always read the manual cover-to-cover on a new piece of equipment and understand it before you fire it up? Do you understand and remember everything you read the first time through? What about new terminology for a new mode? Can you understand and remember it?

If you can answer yes to any of the above, skip this and read something else! This is for those of us who have to read, do, and reread and redo over and over again.

Note that all the answers are "in the book" but are sometimes a little unclear to the uninitiated. These answers apply to the family of TNCs using TAPR based software (TNC1, TNC2, AEA, Heath, Kantronics) and some of them apply to all packet operation.

Q. Why do I receive all packets on the frequency when I am connected to a specific station? It makes the QSO hard to follow.

A. This is controlled by the "Monitor While Connected" command MCON. Enter DISP M (Display Monitor Status) to determine the status of MCON. If it is on, turn it off (MCON OFF). The only thing that will now appear on your screen is what you type and what the station you are connected to types. Normal monitoring will be unaffected.

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This is for those of us who have to read, do and reread and redo over and over again.

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Q. When I am typing, while connected, an incoming packet will be displayed right in the middle of my sentence.

A. This is controlled by the "Type in Flow Control" command FLOW.
1. If FLOW is off and a packet is received, the received packet will be displayed immediately.
2. Turn FLOW ON.
3. If FLOW is on, but you are a slow typist (aren't we all) the output buffer of the TNC will dump to the screen when it gets full. This will happen if you are slow and talking to someone who is fast.
4. This can happen in the command mode too. If MONITOR is on and you are typing an input to the TNC the output buffer can get full and dump the same way as in 2 above.

Q. How do I connect to another station through a digital repeater (digipeater)?

A. You can connect to another station through just one or up to eight digipeaters.
1. If KF4EF in Tampa wants to connect to KC2FF in Clearwater using the KC2FF-7 digipeater, C KC2FF V KC2FF-7 is all that is necessary.
2. If KF4EF in Tampa wants to connect to K4OZS in Ocala using the KC2FF-7 and K4OGS-7 digipeaters, C K4OZS V KC2FF-7,K4OGS-7 will do it. (The "C" and "V" are TNC shorthand for CONNECT and VIA.)

Q. I was trying to use the TRACE command and now I can't access my TNC.

A. The TNC shorthand for TRACE is TRAC. The TNC shorthand for TRANSPARENT is T. If you happen to type T or TR or TRA and a return, instead of the full TRAC or TRACE, you will enter the TRANSPARENT mode, and the TNC will not respond to any normal commands. To get out of the TRANSPARENT mode, enter three quick (less than 1 second) CTRL-C's. In one more second, your TNC will drop back into the "cmd:" mode. If you can't hit CTRL-C that fast, a hardware reset will be required.

Q. I get no print on my screen when typing but everything else seems okay.

A. Turn ECHO ON. This will have the TNC echo input characters back to the screen.

Q. I get duplicate characters on my screen when typing in but everything else seems okay.

A. Turn ECHO OFF or put your terminal in full-duplex. It will depend on your unique setup to determine which way works best. (It has been my experience that ECHO ON and my terminal in full-duplex is best.)

Q. While listening on another receiver, I hear my own call in CW.

A. Turn CWID OFF and PERM. All transmissions from your TNC have your call in each and every packet and CWID'S (which eat up lots of air time) are no longer required by the FCC. Newer TNCs do not even have the CWID capability.

Q. How can I backspace over typing errors and not have the errors and backspaces go out in the packet?

A. Turn DELETE OFF. This changes the erase character from a rubout to a true backspace (CTRL-H).

Q. When disconnecting, why shouldn't I use D twice in a row?

A. This is one that will really burn the connected station up! What this does is disconnect you but does not send a disconnect sequence to the other station. Consequently, the distant station will think it is still connected. It will remain there until the operator manually enters D twice in a row. (This has been fixed in the TAPR TNC-2.)

Q. I am not operating my system but my transmitter keeps coming on.

A. Another station is using you for a digipeater. All TNC's are capable of digipeating. Although the digipeating function can be disabled with a command, you should leave it enabled to support other members of the network.

Q. I am sending in lower case but only receiving upper case characters. The station that I am connected to says he is sending in lower case.

A. Turn LCOK ON. This will allow the TNC to send lower case characters to your terminal.

Q. The station I am connected to says that my packets are overprinting (all on the same line.)

A. Turn LFADD ON. This will automatically add a linefeed after the carriage return.

Q. Everytime I fire up my TNC, I have to re-input all the parameters. Trouble shooting uncovers no problems.

A. After you re-input all of your parameters, enter PERM. This makes your parameters permanent in the non-volatile RAM.

That's it for this month. If you are having trouble, and can"t get it straightened out locally, put a message in any W0RLI MailBox for either KF4EF @ KF4EF or KB4LLO @ KF4EF. Either Don or I will do our best to give you a helping hand.

73, Pat

USING THE ICOM IC-2/02 WITH THE TAPR TNC2

Gwyn Reedy, W1BEL

One of the questions I am most frequently asked is how to use a TNC2 with an Icom IC2-AT or IC02-AT. I have been using both the 2AT and 02AT with the TNC1 for a year or more. The hookup method, devised by Tom, K4GFG, appeared in an earlier BEACON. It consisted merely of connecting the PTT output to the MIC output through a resistor. The resistor needs to be at least 1k to prevent the radio from remaining continuously keyed. When I received my Beta-test TNC2 last May, I tried the same method without success. The radio remained keyed whenever the interface cord was plugged in. The following two methods, however, do work fine with the TNC2.

Method 1. This is directly from the TAPR TNC1 (thats right, TNC1) manual, page D-1. "The IC-2AT keys the transmitter by completing the ground connection on the microphone. The cleanest way to interface to this combination is to use an audio transformer, connecting the primary side to the TNC audio out and return lines, and connecting one side of the secondary to the microphone input of the IC-2AT and the other to the PTT line on the TNC. Almost any transformer should work, provided the turns ratio is not too great."

I used a tiny Radio Shack transformer (not listed in catalog) that was small enough to attach to the TNC end of the cable with a section of heat shrink tubing.

Method 2. This method is recommended by the primary TNC2 hardware designer, Paul, AD7I. Just place a .1 MFD capacitor in series with the MIC audio line for DC isolation. That will prevent the ICOM from keying up when the mic plug is inserted.

So You Want To Try Something New? How 'Bout The AEA Packet Breakthrough!

Because:

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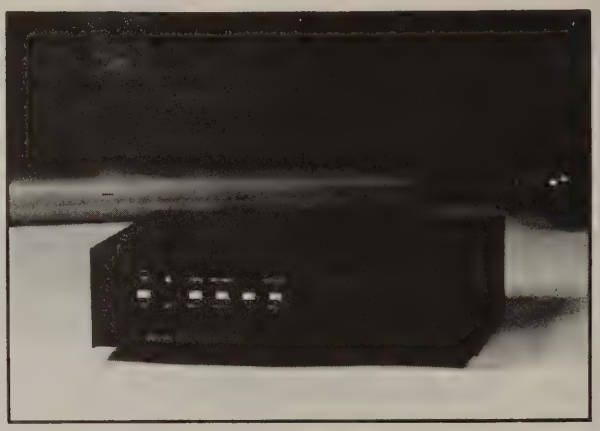
You'd like to learn something new!
You want to send error-free messages on HF/VHF/Satellite in spite of QRM!
Frequency in use? No problem!! Jump right in and transmit!!
No VHF line-of-sight path to Joe? Again, no problem! Digipeat through other stations to Joe!
Joe's not there? Store a message at his station!
RTTY is too slow? "Packet away" at up to 1200 baud or more.



In Packet Radio, your station is a radio, a computer terminal, and a TNC (Terminal Node Controller, hopefully the AEA PKT-1). You type and the TNC sends short bursts (packets) of two-tone modulation called AFSK. The other station decodes them and displays them on his monitor screen. He then sends to you.

There is a lot of activity—local clubs, voice nets, mailboxes/bulletin boards, links between bands, long range (digi)repeaters and chained digipeaters, voice nets, search/rescue and emergency work, newsletters, satellite communications, technical development of new equipment and software, etc. 220 MHz will be very important to packet radio. Help us populate it and "Save the Band"!! We need your help and participation.

```
AEA Packet Radio
RAM length is 2000
cmd: connect to N7ML via KB7G, K6RFK
cmd: ***CONNECTED TO N7ML
Hi Mike - have you seen the great new AEA
   PKT-1?
YES JOHN - LOOKS GOOD K
Bye Mike sk
cmd: ***DISCONNECTED
cmd:
```

Packet radio is:

Standardized—your station can talk to any other packet station.
Popular—fast growth over the last year to about 2000 stations in the U.S.
Multi-frequency—10.147, 14.103, 145.832, Oscar 10, 145.01 (and other local 2M frequencies) are being used now.
Public Service—traffic handling, search and rescue, public events, emergency service.
Multimode—conventional radio, meteor scatter, but no EME/moonbounce yet (will you be first?).
Simple—you control the PKT-1 by typing 5–6 simple one- to four-letter command words on the terminal or computer. Several of them are shown in the above monitor screen simulation, which shows a connect via digipeaters, and an interchange between two stations.

It's easy to get going. You probably already have the radio, and the computer or terminal. You'll need to operate your computer in RS232C mode using "communications terminal" software that is free or cheap. We can usually furnish information on what to use for popular computers. The rest of the software is resident in the PKT-1 (you will need to buy a PKT-1). And you need a MIC connector to connect to the (furnished) radio cable you'll plug into your radio MIC jack. And "BRAAP," you're on the air with "Packet Racket."

You're likely aware of Packet Radio already. If not, read WB4GXD's three excellent tutorial articles in the Sept. and Oct. '83 and Jan. '84 issues of *73*. Clip the coupon below, and we'll send articles, a reading bibliography, product literature on our PKT-1 Packet Controller, answers to commonly asked questions about packet radio, lists of packet clubs in your area, sample packet newsletters from the ARRL and clubs, AEA dealer locations, packet videotape and audio cassette loan info, voice net info on HF/VHF where you can listen and ask questions, a blow-by-blow description of how easy it is to get started, a free AEA Packet Lapel Button, AND WE'LL PUT YOU ON OUR PACKET MAIL LIST to ensure you'll get further mailings!!!

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CONNECT – THE BEGINNERS COLUMN

Don Deem, KB4LLO

The PBBS hurrah was again one of the major topics at Melbourne. I don't wish to devote too much more space to the subject except for the following. I certainly hope that those of you in the system who have experience and are able to utilize this service with minimal difficulty will have patience with those of us who are still learning. And to those of you who are learning to use the system, do yourself a favor and contact the system operator and ask for assistance. You will find him more than willing to assist you. And to those of you who don't use the PBBS, and don't especially care for them, remember that the majority of us in packet radio are well-served by the system and we enjoy the advantage of its use. Do yourself a favor and try it.

There have been several requests for information on packet radio of a general nature lately, so it was suggested that I include in this column a list of information sources. I will add to this list as I become aware of new sources of packet information. First and most important, I recommend that you reread your back copies of the Beacon. The Beacon is the best single-source reference I have found. The TAPR Packet Radio Bibliography was the source of many of these articles.

NEWSLETTERS

PSR Quarterly, an excellent technical newsletter offered by Tucson Amateur Packet Radio Corporation, P.O. Box 22888, Tucson, Az. 85734. $12 yearly.

GATEWAY, The ARRL Packet Radio Newsletter, bi-monthly packet news. ARRL, 225 Main St., Newington, Ct. 06111. $9 yearly ($6 for ARRL member).

AMRAD NEWSLETTER. Amateur Radio Research and Development Corporation, WM. B. Pala, 5829 Parakeet Dr, Burke, VA 22015. $15 yearly.

NEPRA PacketEar, Newsletter of the New England Packet Radio Association. NEPRA, PO Box 15, Bedford, MA 01730. $15 yearly.

GRAPEVINE, Newsletter of the Georgia Radio Amateur Packet Enthusiast Society, PO Box 1354, Conyers, GA 30207

UPRA CONNECT, Newsletter of the Utah Packet Radio Association. UPRA, 4382 Cherryview Dr., West Valley City, UT 84120. $10 yearly.

ZERO RETRIES, Journal of the Northwest Amateur Packet Radio Association. NAPRA, 13304 131st St KPN, Gig Harbor, WA 98335.

BOOKS AND PHAMPLETS

AX.25 Amateur Packet-Radio Link-layer Protocol, an official technical refernece. ARRL, address same as above

Proceedings of the ARRL Amateur Radio Computer Networking Conferences, Vols 1 through 4. THE source for historical and technical packet information. ARRL, address as above

The 1985 ARRL Handbook For The Radio Amateur. Newington: ARRL

"Computer Networks" A. Tannenbaum. Prentice-Hall, Englewood Cliffs, N.J. 1981

"Understanding Data Communications" Texas Instruments. Available at Radio Shack

MAGAZINE ARTICLES

"The Packet Radio Revolution", VE2PY, 73 Magazine, December 1978

"An Introduction to Packet Radio", VE2BEN, Ham Radio Magazine, June 1979

"The Making of an Amateur Packet-Radio Network", Paul Rinaldo and David Borden, QST, October 1981

"Packet Communications in the Amateur Radio Service", Roy Rosner, CQ Magazine, November 1982

'Packet Radio", Peter Eaton, Micro Cornucopia Magazine, June, August, and October 1983

"Amateur Packet Radio" Margaret and Dan Morrison, Ham Radio Magazine, July and August 1983

"Join the Packet Radio Revolution" Lyle Johnson, 73 Magazine, September and October 1983, and January 1984

"Bulletin Boards in Space", John Markoff, BYTE, May 1984

"ARRL Board Approves AX.25 Packet-Radio Link-Layer Protocol" Paul Rinaldo, QST, December 1984

"What's All This Racket About Packet?", Harold Price, QST, July 1985

"A Closer Look At Packet Radio", Harold Price, QST, August 1985

THE FADCA SOFTWARE LIBRARY

FADCA is now establishing a software library. Howard Fisher, N4KPU, has volunteered to be the librarian. The library will specialize in public domain software oriented to the amateur using digital communication methods. We will provide a full suite of Xerox 820 software, CPM and MSDOS development tools and terminal programs etc. There will be limited support for Commodore 64 and other popular computers, also.

Howie has the ability to do both 8 inch CPM and 5 inch MSDOS formats, as well as most Heath H-89 supported 5 and 8 inch formats. He will have access to equipment producing Kaypro and C-64 disks, and possibly other brands. If we can work out all the arrangements, he will be able to provide EPROMmed software also. Charges will be nominal and intended only to cover operating expenses. Any excess funds will accrue to FADCA.

Please send your software contribution to Howie at the address below. Provide whatever documentation you can on the diskette and include your name and address as well. Next month we will list the initial library offerings.

Howard Fisher, N4KPU
3191 Willow Rd.
Wimauma, FL 33590

FADCA MEMBERSHIP CONTEST

FADCA is running a membership contest from now until January 31, 1986. The rules are simple: The person that enrolls the most new FADCA members during this period will receive a TAPR TNC2. (That prize will not be awarded if the top contestant enrolls less than 15 new members.) Other prizes that have been lined-up so far include a $295 discount certificate on the purchase of an Amateur Wholesale Electronics O-777 computer interface, and a number of subscriptions to Florida Skip. It is anticipated that additional prizes will be made available as contest participation warrants.

Credit for enrollments is earned based on the annotation of the contestant's name or callsign on the new member's enrollment form. The new member may also claim credit for his own enrollment if he also chooses to enter the contest.

So, get busy. Make some copies of the membership form in last month's issue, or send an SASE to FADCA for a new supply (Say how many you need). Show your BEACON issues to your friends, get them to do themselves a favor by joining FADCA, and help yourself to that TNC2.

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Specifications Subject to Change

SOUTHNET II CONFERENCE UPDATE

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GEORGIA TECH AMATEUR RADIO CLUB
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GEORGIA RADIO AMATEUR PACKET ENTHUSIAST SOCIETY

TO BE HELD ON NOVEMBER 23 & 24, 1985
ON THE CAMPUS OF GEORGIA TECH, ATLANTA, GA.

FEATURING

UNVEILING OF THE NEW TAPR NETWORK CONTROLLER
BY LYLE WA7GXD & PETE WB9FLW

****

DEMONSTRATION OF THE NEW GLB TNC
BY ED JACKSON OF GLB

****

DEMONSTRATIONS OF ALL CURRENT TNC HARDWARE

****

SOUTHNET COMMITTEE AND ORGANIZATIONAL MEETING

****

AWARDS FOR SOUTHNET PACKETEER OF THE YEAR
OTHER AWARDS FOR SOUTHNET PACKTEERS

TECHNICAL SESSIONS
PROGRESS OF DIGIPEATERS IN SOUTHNET REGION
9600 BAUD MODEM PROJECT UPDATE
220 MHZ LINKING PROJECT STATUS REPORT
NETWORKING PROPOSALS AND WORKSESSIONS
WORLI GATEWAY MAILBOX UPDATES
XEROX 820 COMPUTER POTPOURII

NON TECHNICAL SESSIONS
FORMATION OF A PACKET OPERATORS GUIDE
PETE'S FAMOUS "PACKET PRIMER" (OR EQUIVALENT)
DEMONSTRATIONS OF PACKET OPERATION OF ALL CURRENT TNC'S
USER INFORMATION GUIDES AND PRODUCT INFO

****

```
C2976 CC19  Tom Clark  (W3IWI,2976)
9/20/85   1:41 AM  L:57
KEYS:/TNC2 WITH WORLI 10.0 PBBS/
     WORKS GREAT!/
```

For information, the TNC2 works great! with a WORLI BBS -- I have oneonline on my 145.01 input port. For information, here is a dump of the critical parameter settings:

```
AUTOLF    OFF
AWLEN     8
BKONDEL   ON
BTEXT     *
  (* means set by BBS software)
BUDLIST   OFF
CHECK     25
  (additional timeout protection)
CMSG      ON
  (if you want to send CTEXT msg)
CR        ON
CTEXT
  (text sent on connecting)
COMMAND   $03
CONOK     *
CONMODE   CONVERSE
CONSTAMP  OFF
DAYUSA    ON
DELETE    OFF
DWAIT     36
  (4 times what you use with TNC1)
DIGIPEAT  OFF
ECHO      OFF
FLOW      ON
FRACK     8
HEADERLN  OFF
HID       OFF
MONITOR   *
MALL      ON
MCON      OFF
MFILTER   $00
MRPT      OFF
MSTAMP    OFF
MAXFRAME  5
MCOM      ON
NEWMODE   OFF
PACLEN    128
PARITY    0
PASS      $16
PASSALL   OFF
PACTIME   EVERY 1
RETRY     8
SCREENLN  80
SENDPAC   $0D
START     $11
STOP      $13
TRFLOW    OFF
TRACE     OFF
TXDELAY   25
   (4 times the TNC1 value)
TXFLOW    OFF
UNPROTO   MAIL VIA xxxxx
XFLOW     OFF
   (enable hardware handshaking,
     disable Xon/Xoff)
XMITOK    ON
XOFF      $13
XON       $11
```

Also be certain to install JMP1 to disable RS232 pin 8 (DCD) having connect status data.

73, Tom

```
#: 32722 S9/Packet/RTTY/AMTOR
    15-Sep-85  00:34:45
Sb: #TNC Selection
Fm: Jeffrey Goulston 71236,262
To: All
```

It seems to me that there are many different makes of TNCs out there. Could Anyone tell me the major differences between the different models of commercially available TNCs. I'm a bit new at this and I would love to get more involved but I need to know more about the available hardware.

tnx Jeff (WB1EBU)

```
#: 32728 S9/Packet/RTTY/AMTOR
    15-Sep-85  01:24:05
Sb: #32722-#TNC Selection
Fm: Scott W3VS 76703,407
To: Jeffrey Goulston 71236,262
```

Jeff, welcome to HamNet! To answer your question about TNC's, there are several different "categories" of TNC's available. Roughly, it sorts out this way:

1. TAPR TNC-1 based units including the Tucson Amateur Packet Radio (TAPR) unit itself along with the clones from AEA (PKT-1) and Heathkit (HD-4040). These units have set the standard in amateur packet radio.

2. GLB. This unit took a completely different approach to implementing packet. Found frequently in dedicated digipeater service but the command set, etc. can get in the way for on-line use.

3. Kantronics. A hybrid based on the high level Pascal code used in the TAPR TNC-1 but with Kantronics' developed drivers. Available fully assembled for $219 list.

4. TAPR TNC-2. The latest in packet technology. Kit form only. Waiting list of a month or two to get one. Round two of packet from the Tucson gang. Includes a number of improvements to the software interface - and 12VDC power (also a low power CMOS option).

Hope that helps sort things out! If you've got further questions, please shout em out! Lots of packet folks on HamNet!

```
#: 32838 S9/Packet/RTTY/AMTOR
    17-Sep-85  21:03:00
Sb: #32728-#TNC Selection
Fm: Jeffrey Goulston 71236,262
To: Scott W3VS 76703,407
```

Now I have a better understanding of what is available. However I have some requirements. I wonder if you might be able to tell me if any of the available TNCs fit the bill. First I would like to be able to use the TNC as a digipeater and talk to someone else at the same time. In addition, I would like the unit to be able to be battery powered. Any suggestions. Tnx Jeff (WB1EBU)

```
#: 32843 S9/Packet/RTTY/AMTOR
    17-Sep-85  21:57:30
Sb: #32838-TNC Selection
Fm: Scott W3VS 76703,407
To: Jeffrey Goulston 71236,262
```

The best TNC for battery operation is the TAPR TNC-2 with all CMOS parts. It should draw less than 100 ma at 12 volts. On the digipeater question, all the TNCs can operate as digipeaters concurrent with normal operation. (The new GLB mentioned in this issue would also be ideal. ed.)

```
M 25329 Larry Freeman (LarryF,1218)
9/18/85   8:24 PM  L:30
KEYS:/PKT RADIO/GETTING INVOLVED/
TO: ALL
```

The general concensus is that the TAPR 2 is the best of the packet communicating devices available. This concensus comes from the cogniscenti, Italian, for the guys who know the most about it.

Well, how about packet radio communicating devices for guys who don't want to take the time to make up a kit? Are they out of packet? Or what are their alternatives?

How about Kantronics? $219 for a device already built. Will it be obsolete sooner than will be the TAPR 2? Is it as adaptable to the future of packet? Will a purchaser of a Kantronics Packet Communicator (TM) be able to interface with users of TAPR 2 or will he be sorry when he sees what the TAPR 2, state of the art now, can do now and for the foreseeable future. For example, access to BBs. How about teleconferencing via packet? Is that practical now? In the future? With TAPR 2? With Kantronics? With AEA? Globe?

It seems to me that the more of us who get on packet now and in the near future, the more secure will be packet as a mode of communications. Is it a fad? Surely not. But to get the best - build a kit. But life is short, and, for some of us, packet and ham radio are not the end-all and be-all of our lives - only part of it. And kit building is static on the bandwidth of a life span.

Would it be helpful to have a pro - con comparison of what's available for packet communicating now?

Again, what are the alternatives? There are alot of hams out there waiting and watching. How do we get them involved? Larry (W2QJV)

```
#: 32801 S9/Packet/RTTY/AMTOR
    16-Sep-85  20:39:18
Sb: #WORLI PBBS INFO
Fm: Jon Pearce, WB2MNF 70206,421
To: Steve Goode K9NG 70525,364 (X)
```

(For Pete Eaton, WB9FLW)
Hi, Pete. Noted several comments about the WORLI SYSOP documentation and figured I'd fill in some holes. I assume that the copy that you have is the one that I gave to Lyle at Dayton this year. I don't know what version it is, but the most recent is for version 9.5 of the software. I have the doc files on my 820 and am waiting for my AT&T 6300 before updating it for Version 10.0 (the file is about 100K and I need the hard disk). I hope to have it updated by the end of the month. People can get copies from me by sending about $1.50 for the postage (it's about 45 pages long now), although I think I might be losing my source of free high-volume copying soon and may have to resort to sending out Wordstar files on disk. I'll post a note up here when the 10.0 doc is ready, although if someone wants to write for it now I'll send it when it's ready. I'll also send a copy out to TAPR - you guys sure deserve it. 73, Jon Pearce; 109 Pine Cone Trail; Medford, NJ 08055

Continued >>>

Fm: Jerry Stuckle AIOK 72205,234
To: Steve Goode, 70425,364

(For Pete Eaton, WB9FLW)
Just thought I would leave you a note on the status of Packet Radio in the Raleigh, NC area. There are several TNC-2's on here, and all went together very smoothly. One person had a problem (Bob,AA4L) but your new '4066 chip fixed that. Several of us had problems with the demod calibration, but counter and scope fixed that real nicely, also. In other words, not much trouble, and everyone is very happy with their kits. At least 4 of us have TNC-1 versions sitting around doing nothing, as we are so happy with the TNC-2!

Also, we have just formed the Wake Digital Communciations Group and passed the Constitution and Bylaws last Thursday. So we now have a formal group here to work with. We are proceeding on a digipeater here, and hope to have it up about 750' in a month or so. Hardware is almost ready, but we have to wait for some tower work to be done before we get use of the antenna. The digipeater is going to be duplexed on the same antenna as the 147.15 repeater transmitter.

Also, if we can be of any help in the NC area either technical or otherwise, let me know. We have several engineers here, and a lot of programmers. As you probably know, Raleigh is a high-tech area, and many of us work with this type of stuff every day. We would be glad to help any way we can. If you would like to get ahold of us, you can contact me through EMAIL here (I don't get on HAMNET enough - spent all my money at TAPR!) or by phone.
I am tentatively planning on attending the SOUTHNET convention in November, and wonder if you are going to be able to make it. I would like to meet the great WB9FLW, who has helped so much with Packet Radio! Thanks much for helping produce such fine products in both the TNC-1 and TNC-2, TAPR's additions to the Amateur Radio fraternity will be long remembered!

Jerry Stuckle, AIOK

Date: 26-Sep-85 03:19
From: BILL JOHNSON [72437,2276]
Subj: OH! I KNOW YOU

HELLO GWYN
WELL GLAD TO MEET YOU. I MUST SAY THAT THE FADCA BEACON IS A GOOD NEWSLETTER. I WAS GLAD TO GET THE BACK ISSUES. IT LOOKS LIKE I AM THE FIRST HAM IN THE SOUTHERN N.M., WEST TEXAS AREA TO GET ON PACKET. THE INFO THAT I HAVE ON PACKET IS SKETCHY. SOME OF MY QUESTIONS AND PROBLEMS ARE ANSWERED IN THE BEACON. I AM REALLY THIRSTY FOR INFORMATION ON WHAT HAMS IN OTHER AREAS ARE DOING IE.. WHAT CIRCUITS WORK BEST. IS ANYONE USING THE COCO AS A TNC. WILL THE COCO INTERFACE WITH FADPAD? HAS ANYONE EXPERIENCED TROUBLE WITH THE COCO IN 8 BITS? ETC. I THINK BEACON ANSWERED SOME OF MY QUESTIONS ABOUT REPEATER FREQS. IF WE DIDNT GET SOME INFORMATION HERE WE COULD HAVE MAYBE PUT A BEACON IN THE MIDDLE OF 6 METERS. IF YOU KNOW WHAT I MEAN. WELL THANKS FOR A GOOD PUBLICATION. IT HELPS US OUT HERE IN THE BOONIES.
73'S BILL

#: 33032 S9/Packet/RTTY/AMTOR
22-Sep-85 19:30:19
Sb: #33028-New to Packet
Fm: Scott W3VS 76703,407
To: MARTY K4VM 70017,2665

Marty, I think you'll find packet is the way of the future for the NTS. Here in the Bay Area, we've got a mailbox capable of originating NTS traffic via packet (into RN6 or the Northern California Net). The rough edges are still being worked out - but once there's a true packet network, NTS should be one of the primary users!

Try packet - you'll find it an exciting combination of amateur radio and computers.

Msg# TR Size To
From @ BBS
987 PN 538 W1BEL N2WX
Date Title
851004 equal time for all bug rpts!

At Melbourne FL N2WX, In 851003/2331et, Out 851004/0039et

2071 BN 417 ALL K5TAN MIA
851003 KANTRONICS PC-1 BUG

I have noticed, along with others that the PC-1 executes a buffer dump of previously printed packets when an ack is dropped. This is apparent as a packet being repeated on the screen when in the connected mode. Rich, NS4S and I have written Kantronics and they are working on it. If you have noticed the problem, let me know and write them yourself. They say they have never seen the problem before.

Msg# TR Size To From @ BBS
988 N 1437 W1BEL K4EID

Date Title
851004 Fwded from K4EID at 1706z

At Melbourne FL N2WX, In 851003/2320et, Out 851004/0040et

At K4NTA: 1827 From K4EID Rcvd 851003/1424, Sent 851003/2319

Via WORLI: 6864 From K4EID Rcvd 851003/1708z, Sent 851003/1817z

1347 N 1186 W1BEL K4EID
851002 Knoxville area update #2

"Handles" of local stations:
KC4OI - Clayton
K4EID - Bob
ND4F - Richard
WB4TGB - Mark
WB4KXB - Sherrell
WB4JSD - David
WB8BFS - Jack
KB4NK - Bob
KA4BRA - Jim
K4MJM - Bill
N4TD - Taylor
WA4BKY - Clif
WA4SXM - Gould

No paths are yet open and reliable. WB4BFS-2 is workable at times, Under unusual conditions, we have worked WB8FQJ-1 and have connected WB4BFS-2, WB8FQJ-1, WA8USO-1 and WB4BFS-2, W4FX-1, WB4GQX-1, K4HAL-1

Msg# TR Size To From @ BBS
990 BN 941 W1BEL K4NTA
Date Title
851004 FYI & BEACON

At Melbourne FL N2WX, In 851003/2316et, Out 851004/0047et

At K4NTA: 1839 From K4NTA Rcvd 851003/1950, Sent 851003/2316

1784 F 762 W5HUQ KC2TN
851001 congratulations!

At KC2TN: 488 From WB2RVX Rcvd 851001/0720, Sent 851001/1535

At WB2RVX: 1621 From WB2RVX Rcvd 851001/0629, Sent 851001/0720

1620 N 513 W5HUQ WB2RVX K4NTA
851001 congratulations!

Hi John! Congratulations on completion of our 2m packet QSO this evening. I'm sure glad you had a lot patience while I got things together up here. I think the biggest problem was the foot switch to the amp as I'm sure now that I couldn't release it in time to hear your acks. After changing txd to 10, I had no problem with the copy. I'd like to try a contact sometime in Dec. during the Geminids if you're interested. You can contact me via the KC2TN HF gateway
73's - Mike
(P.S. I estimate the contact path to be about 850 mi.)

Msg# TR Size To From @ BBS
Date Title
1070 Y 1293 W1BEL W5HUQ
851006 INFORMATION ON DX

At Melbourne FL N2WX, In 851006/0035et, Out 851006/0334et

At K4OZS: 332 From W5HUQ Rcvd 851005/2306, Sent 851006/0031

GWYN
THE BAND OPENED REAL STRONG MONDAY EVENING AT APPROXIMATELY 1830 EDT 09-30-85 AND REMAINED OPEN UNTIL I WENT TO BED AT 2400 EDT. I WORKED FROM FLORIDA TO MAINE ON SSB AND AT 2112EDT CONTACTED WB2RVX AND WE DISCUSSED TRYING PACKET AND MOVED DOWN TO 144.180 AND TRIED IT BUT HE HAD DISTORTION ON HIS TRANSMIT AND HAD TO CHANGE TNC AFTER WHICH I GOT AN IMMEDIATE CONNECT BUT HE WAS NOT GETTING MY ACK'S.I CHANGED MY TXD TO 10 AND WE MADE IMMEDIATE CONNECT. DURING THE TIME MYSELF AND MIKE WB2RVX WERE CURING THE PROBLEMS MYSELF AND K1HTV WERE SUCCESSFUL ON TWO OCCASIONS IN CONNECTING AND EXCHANGING INFORMATION. DURING THIS TIME WB2KMY WHO WAS NOT ABLE TO TRANSMIT ADVISED ME BY VOICE THAT HE WAS RECEIVING EVERY PACKET SENT. K1HTV ALSO ADVISED THAT HE WAS RECEIVING EVERY PACKET SENT. I DO NOT KNOW THE EQUIPMENT ON THE OTHER END. ALL CONTACTS WERE MADE ON USB AT 1200 BAUD ON 144.180. I WAS USING A YAESU FT726R DRIVING A TEMPO AMPLIFIER AT 1200 WATTS OUTPUT TO A PAIR OF CUSHCRAFT 19 ELEMENT BOOMERS AT 80 FEET. I ALSO HAVE A GASFET PREAMP AT THE ANTENNA. THE DISTANCE TO WB2RVX IS APPROXIMATELY 760 MILES. 73 AND THANKS FOR THE INTEREST. JOHN

Continued >>>

From: Pete WB9FLW
Subject: Some Pats on the Back
Dist: Open

The last couple of weeks have been hard on all of us, but we hung in there. Many times the people who do most of the work never seem to get any feedback from the folks they help. Listed below are some of the comments that are posted on CompuServe on the HamNet SIG (Special Interest Group).

"TAPR service is GREAT!!! (and the U.S. mail isn't half bad). Last Wednesday afternoon I mailed my TNC 2 to TAPR in New Jersey to have a small problem checked out. It arrived back at my local Post Office today, exactly five days later. I think that this kind of service is almost unheard of and I want to congratulate TAPR. I didn't think it was possible to get a package from Albuquerque New Mexico to New Jersey and back in that amount of time, much less fixing it also. THANKS to the crew at TAPR! "-Richard Stump KD5VV-

"I agree lets see Kantronics top that kind of turn around with their almost TAPR clones!" -George N2AIG-

"My Hat's off to you and the entire TAPR Crew!" -Bill KA1KF-

"Once again Thanks! Your call was a plesent surprise...a personal touch which is appreciated" -Ed WA2ZDV-

TAKE A BOW GANG YOU DESERVE IT! NOW GET BACK TO WORK!!!!!! (Hi!)

M 28010 Lyle Johnson (WA7GXD,2973)
9/27/85 9:54 PM L:15
KEYS:/XEROX 820 BLOWOUT!/COME AND GET 'EM WHILE THEY LAST!/
TO: ALL

Xerox 820 Stuff for Sale

I have two each complete Xerox 820 boards (they were tested with video, 8" drives, etc.) in April 1984 for the TAPR Dayton booth, then stored and never used again), a Shigart--make that Shugart-- 800-2 drive (ss/sd with the larger faceplate) and a Shugart 850 (ds sd or dd i believe). The 800-2 was used at the Dayton booth, the 850 was just overhauled and had the PC board replaced. None of this equipment has been used since.

I also have a full closet and no time. So, anyone who wants to get an 'RLI system up, or whatever, I will sell both boards and both drives (no cables, sorry) for $200 plus UPS. If you are interested, please get in touch with me!

Lyle

Date: 26-Sep-85 00:05
From: Steve WB8HRV [75236,341]
Subj: M-100 RTTY

I have uploaded the files RTTY.100 and RTTY.DOC in DL1 of M100SIG and DL9 of HAMNET. As soon as the sysops clear them, they'll be available. Have fun!!

Steve WB8HRV

Msg# TR Size To From @ BBS
Date Title

1067 Y 1213 W1BEL KF4JF
851006 Forwarded from KF4JF at 0212z

At K4OZS: 334 From KF4JF Rcvd 851006/0231, Sent 851006/0233

1230 N 1081 W1BEL KA4OVX
851006 Forwarded from KA4OVX at 0606

3 N 1031 W1BEL WB4GQX
851006 SOUTHNET REPS

GWYN, THE SOUTHNET REPS FOR THE STATE OF ALABAMA WERE ELECTED OCT. 5 TH. THEY ARE : N4HY, BOB MCGWIER. I WILL TRY TO GET U A GOOD ADR ON HIM. THE OTHER IS WA5RAX, JIM GRIFFITH, 104 LADYWOOD LANE , BESSEMER, ALABAMA. 35020.

ITEM 2.... DO U HAVE ANY IDEA WHAT THE OUTLOOK IS FOR NORTHERN FLA TO CENTRAL FLA AS FAR AS A SOLID PATH IS CONCERNED? IS ANYTHING IN THE WORKS? SEEMS THAT A LOT OF CHANGES ARE GOING ON, GUESS SOMEONE IS TRYING SOMETHING. HI HI HI.

GUESS THAT IS ALL FOR THIS TIME..... OH YES, GUESS U GOT MY NOTE WITH THE SOUTH CAROLINA REPS IN IT. SHOULD HAVE WAITED ABOUT TWO MORE WEEKS BEFORE SENDING YOU THAT ITEM ABOUT CONNECTING INTO THE NORTH LAND. IT HAS HAPPENED. WE NOW HAVE A PATH TO WEST VIRGINIA WITH ONLY FOUR DIGIS. I JUST RECEIVED WORD THAT ANOTHER ONE IS UNDERWAY THAT WILL LINK WITH THE WEST VIRGINIA MACHINES. GUESS WHERE.... IT IS IN PA. REALLY IS A MOVING BUSINESS . 73, LOOK FOWARD TO SEEING YOU NEXT MONTH. DENNIS

JUNKBOX

FADCA has 8530-A SCC chips which are used on the FADboard with the Xerox 820 to give a dual HDLC output. These are high speed 6 MHz parts. Only $20.00 postpaid.

The FADCA modem kit provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. The price is $8.95 postpaid from the designer and producer:

Jerry Quimby (N4AJH)
601 Verbenia Drive
Satellite Beach, FL 32937

FADCA badges are now available. Badges are 2 1/4" round with locking pin on backside. $1.00 without call letters, $2.00 with. Colors available are yellow, gold, salmon and blue.

ALL parts are available for the TAPR/AEA/Heath TNC including 1935s and 2212s. Contact Bob Boyce, KB4IQM. (305) 967-9999. (24 hours).

#: 32776 S9/Packet/RTTY/AMTOR
15-Sep-85 23:32:36
Sb: #32733-Packet activity in TN
Fm: Frank Emens W4HFU 72415,571
To: MARTY K4VM 70017,2665

Yup, it looks like you'll miss out on all the frenzy that's gonna happen when that thing goes on the air if you don't have a tNC ready. That thing is going to cover a lot of packet operators and also be in a strategic spot for linking the major cities in Tenn. It's going to be something to monitor for a while.

73 & GL

FADCA

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FADCA membership is open to anyone interested in supporting FADCA purposes. Dues are assessed on a calendar year basis beginning January 1st. Members joining during the year receive all back issues of the BEACON. Dues for 1985 are $12.00, payable to FADCA.

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American Radio Relay League
Newington, Connecticut, U.S.A. 06111

Gateway

Vol. 2, No. 1
Aug. 20, 1985

The ARRL Packet-Radio Newsletter

Gateway: The ARRL Packet Radio Newsletter is published by the

American Radio Relay League
225 Main Street
Newington, CT 06111

Jeffrey W. Ward, K8KA
Editor

Larry E. Price, W4RA
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The American Radio Relay League
225 Main St. Newington, CT. 06111 USA

FADCA > BEACON

The FADCA>BEACON is published monthly by the Florida Amateur Digital Communications Association, Inc. (FADCA), 812 Childers Loop, Brandon, FL 33511.

Publisher and Editor - Gwyn Reedy, W1BEL
Layout Editor - Brad Voss, WB8ZPE
Mailing labels - Jim Homan, W4DPH
Postal Expense Support - Phil LaMarche, W9DVM
...And lots of help from many authors. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

Jack Brindle, WA4FIB
Jim Diggs, K4AHO
Ted Huf, K4NTA
Gwyn Reedy, W1BEL
Andy DeMartini, KC2FF
Howard Goldstein, N2WX
Dick Klein, W4PCM
Bill Whitaker, WD4JKM

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President - Gwyn Reedy, W1BEL
Executive Vice President - Ted Huf, K4NTA
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FADCA membership is open to anyone interested in supporting FADCA purposes. For introductory information about FADCA and packet radio please send a self-addressed, stamped (at least 56 cents) 8 1/2 by 11 inch envelope to the FADCA address. Dues for calendar year 1985 are $12.00 and includes all issues of Vol. 2 of the FADCA>BEACON. Dues support newsletter publication and the printing of material for distribution at hamfests, computer and radio club meetings, and by mail.

FADCA>BEACON copies printed:

January 1985	- 590	June 1985	- 500
February 1985	- 580	July 1985	- 600
March 1985	-1000	August 1985	- 600
April 1985	- 500	September 1985	- 600
May 1985	- 500	October 1985	- 700

Information on advertising space in the FADCA>BEACON can be obtained by writing or calling the FADCA office. A rate and layout card is available on request.

Small classified advertisements for FADCA members will be without charge.

Any material appearing in the FADCA>BEACON may be reprinted in any non-profit amateur publication without further permission if credit is given to the author and the BEACON (including the FADCA address.) Commercial publications should contact the FADCA office to make reprinting arrangements.

Reprints of issues of Volume One (1984) of the FADCA> BEACON are available for copying and mailing costs of $1.00 per issue, or $8.00 for the entire year (11 issues). Send your request to the FADCA address.

The DEADLINE for submissions for the NOVEMBER issue of the FADCA > BEACON is OCTOBER 31st. Articles should be in final form using a 35 character column width. Authors should request a style sheet from the editor.

DIGITAL EVENTS

OCT 12/13	Central Georgia Hamfest, Warner Robins Recreation center, 800 Watson Blvd, Warner Robins, GA
OCT 12/13	South Florida ARRL Suncoast Convention in St. Petersburg. Two full days of packet activities.
OCT 12/13	Treasure Coast Ham/Computerfest at Vero Beach.
NOV 23/24	Second SOUTHNET Packetfest hosted by GRAPES. A great weekend at Georgia Tech in Atlanta. Contact WB2CPV.
NOV 30/DEC 1	Broward Hamfest.
JAN 11/12	Sarasota Hamfest.
FEB 8/9	Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park.
FEB 22	Martin County FREEFEST in Stuart.
MAR 1	Hernando County Hamfest in Brooksville.
MAR 7/8/9	Orlando Hamcation. The Third SOUTHNET Packetfest in conjunction with the 5th ARRL Computer Networking Conference.

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THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2 No. 11 | Brandon, Florida | November 1985

ANNOUNCING PACKET RADIO MAGAZINE

Gwyn Reedy, W1BEL

Big changes are in store for the BEACON. Watch for the JANUARY issue. The following features are planned for the first issue of the new year.

- o Larger, clearer type
- o All pages stapled, booklet style
- o A two color, stronger cover
- o More pages, more news, more ads
- o Pages devoted to news from other areas of SOUTHNET and across the country
- o A new name, PACKET RADIO MAGAZINE

A new name? But what about the BEACON? Just look inside PACKET RADIO MAGAZINE and you'll see a section headed by the familiar logo - FADCA > BEACON. You will see pages devoted to other groups too (details still under negotiation).

BACKGROUND

At the SOUTHNET Packet Conference last June (now called SOUTHNET I) the SOUTHNET Coordinating Committee was formed. Discussion turned to a means of communication all across SOUTHNET country and the BEACON was suggested as a possible vehicle. I was excited about the potential for gaining a wider readership, but did not feel I could commit FADCA to this support without consulting the FADCA Directors. Nor could anyone suggest a means of sharing the costs or workload. Since that time I have put out two issues of the TAPR Packet Status Register and have been very impressed with the quality inputs possible when there is a large readership. In addition, increases in circulation allow economies of production such that costs per reader are reduced.

At the October 13 FADCA Directors' meeting, I was authorized to make whatever arrangements necessary to support SOUTHNET and the entire packet radio community while increasing service to FADCA members by improving the size and quality of the FADCA publication. (FADCA is to remain a separate organization and not lose its identity.) At this time representatives of both the Georgia Radio Amateur Packet Enthusiast Society (GRAPES) and the Rocky Mountain Packet Radio Association (RMPRA) have indicated a serious interest in joining FADCA for a group publication. Based on those expressions of interest, I am making the changes mentioned above in preparation for a joint publication. It is my desire to provide a way to tie together the widespread geographic area covered by SOUTHNET and to produce a publication of value to all packet groups everywhere.

DETAILS

How will it work? RMPRA and GRAPES are planning to use PACKET RADIO MAGAZINE (PRM) as their club publication. Other groups may choose to get PRM and also publish a local newsletter. I expect that the most popular arrangement will be to use PRM as the club publication and to provide short term local news electronically. A rough page allocation will be made based on the relative size of each participating organization. This space will be used to contain the local inputs collected and edited by the local editors. The bulk of the issue will be devoted to technical and operational articles of general interest and enough advertisements to pay the bills. These articles of general appeal will be obtained from the entire packet community.

The existing FADCA>BEACON staff will do the editing, layout, printing and mailing for all participating groups. Each group will keep track of their own members' addresses, collection of dues, and local news inputs. FADCA will charge each club monthly based on the number of issues sent and the costs incurred. Charges will be at or near cost.

This is a situation where everyone can benefit. Organizations smaller than FADCA can have a large monthly publication for their members that includes a locally produced section. Editors of these organizations will have more time to prepare quality inputs without worrying about quantity. Because of the larger printing quantities and the FADCA mailing permit, this publication will tax local treasuries no more than a smaller newsletter produced and mailed locally. Most important of all, good technical and operational news will be uniformly provided to all participating organizations. FADCA members will benefit by receiving a larger, better publication than their dues alone can warrant, and a greater portion of dues income can be reserved for the business of network building and operation.

GO FOR IT

FADCA is committed to making PACKET RADIO MAGAZINE happen. If you think your organization could benefit from participating in this venture, have them contact me for further details. Individual members...be sure to renew and tell your friends, because this is going to be a publication you won't want to miss.

SEBRING LINKING MEETING

Tom Kneisel, K4GFG

The Lunchbox Restaurant in Sebring had a good crowd on Sunday, Oct. 27, as 28 packeteers (and about 10 XYLS) gathered for a luncheon followed by discussions about digipeaters and linking. (The XYL's went antique shopping.)

Andy, KC2FF, chaired the digipeater update session where digipeater representatives from Orlando to Homestead reported status on their machines. New digis reported at this session include Fort Lauderdale (FTL) and Homestead (HST). By the way, Homestead now links to WA1JOU-2 in Naples during evening and morning hours. Orlando reps agreed to begin using the mnemonic ORL and Andy said KC2FF-7 will be changed to CLW as soon as new EPROMS are received. KB4CIA is linking to KC2FF-7 on 220 MHz and will tie his MailBox on 145.05 to the 220 link.

Ted, K4NTA, chaired a session to discuss coordination of digipeaters. Three classes of digipeaters were proposed: Primary, Secondary, and Uncoordinated. Precise definitions will be worked out, but the general idea was that a secondary digi is a station which digipeats on a fairly regular basis for his LAN's benefit, but may change his antenna heading or shut down from time to time. Most home stations who digipeat only occasionally would be uncoordinated, requiring no formal registration. A registration form and other criteria for Primary and Secondary digipeaters were discussed. A committee was then formed to formulate and administer FADCA policy on packet frequency coordination. Pending Board of Directors approval, the members are WB4KGY, K4AHO, K4GFG, KB4CIA, W4DPH, and K4NTA, Chairman. They will be working to get registration and coordination into gear, so let them hear your views.

Continued on page 2.

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NEWS AND VIEWS

Gwyn Reedy, W1BEL

FULL DISCLOSURE

I want to make an annoncement right up front this month to let everyone know what I am doing and avoid any problems caused by possible misinformation.

Andy Demartini, KC2FF, and I have started a business that sells to the packet radio community. We will be doing business in Tampa as PacComm Packet Radio Systems. This is a private venture, fully separate from our volunteer work with TAPR and FADCA. PacComm Packet Radio Systems is purchasing the OEM kit for the TAPR TNC2 and will shortly have available TNC2 bare boards, hard-to-find parts kits, full kits, cabinets, etc. Andy and I hope to use this venture to eventually get into the commercial arena and do not expect to become kingpins of the amateur market. It is, however, an opportunity for both of us to gain a foothold in a business dealing with the technology we enjoy so much. It is also a chance to serve the people of the group that has been so great to belong to - the packeteers. By offering bare boards and parts kits, we hope to help out the builder and experimenter, and the ham on a tight budget. We plan to introduce additional products in the near future.

CONFLICT OF INTEREST?

There are a number of questions that can be asked about this situation.
Q. Why didn't FADCA procure the OEM agreement and produce the TNC2?
A. FADCA has neither the cash nor the credit for a venture this size.
Q. Did Andy and I have favored treatment from TAPR in any way?
A. No, we are paying our OEM fee just like any other business.
Q. But didn't we have inside information on TAPR's plans?
A. No. Although I am a member of TAPR and editor of the TAPR PSR, I didn't even know they were stopping production until I called to order the 'FADCA membership contest TNC2' and was told they were possibly sold out. (We got one.)
Q. How will Andy and I be able to avoid conflict of interest in running FADCA and (for me) editing the PSR?
A. There is the potential for abuse in the situation. But I have put several years of devoted effort into FADCA (and strongly supported TAPR too) and Andy has a strong record of support too. We are not about to scuttle that for a short term financial gain. We both intend to continue to voluntarily support the packet community in every way that we can.

I won't use this publication after this to comment on my business affairs (but will submit paid advertisements). I felt it was important to do so this time to avoid the appearance of any secretive activity. I encourage any FADCA member to discuss the matter with one of the other Directors if they desire.

FADCA DIGIPEATER COUNCIL NEWS

Ted Huf, K4NTA

FADCA Digipeater Council? What in the world is that? Well, at the Sebring linking meeting it was decided that FADCA should form a council to coordinate digipeaters. The Florida Repeater Council (FRC) assigned 145.000 to 145.100 for packet radio. The FRC delegated to FADCA the actual coordination of the digipeaters on these frequencies. The FDC has been assigned the responsibility of coordination of digipeater frequencies, assignment of mnemonics and record keeping.

The Council members are volunteers that were selected at the meeting. K4GFG (Ft Lauderdale), WB4KGY (West Palm Beach), KB4CIA (Port Charlotte), W4DPH (Clearwater), K4AHO (Orlando), and K4NTA (Stuart). Anyone else desiring to participate in the FDC should contact the Chairmen, Ted Huf. Someone from North Florida would be appreciated.

The FDC will be soon sending out a registration form to all known wide area digipeater trustees for the initial registration. Anyone desiring to operate a new digipeater after December 1, 1985 should apply to FDC via K4NTA. Next month we will have more on this.

THE SEBRING LINKING MEETING

Continued from previous page.

Next I led a discussion on auxiliary linking of digipeaters on 220 Mhz. It was decided that since suitable RF gear for use with the K9NG modems has not yet been identified, we would begin linking at 1200 baud. This will allow the use of numerous radios already on hand. When suitable RF gear has been identified, the network will be upgraded to a higher speed, probably next year. Keep that in mind when looking for a 220 Mhz radio for the low speed linking now.

Ted described the digital hardware required for the network node controller. It centers on the Xerox 820, which will initially be used with the KE3Z dual-port digipeater software. A description of how this software works can be found in the July issue of TAPR's "Packet Status Register". By the way, this is the software that California is now bringing up on 220 Mhz for auxiliary linking of their digipeaters. The dual-port code will be replaced by a true network layer as soon as one is available.

Over a year ago FADCA formed a Linking Committee to guide the implementation of auxiliary linking of Florida digipeaters. What's now needed are some volunteers to rejuvenate the committee and guide the digipeater owners with the implementation.

The next meeting of digi owners and concerned linkers is scheduled for Sebring on January 12. By that time we should have some digipeater sites up and running with auxiliary links!

BYTES FROM THE WRITE ONLY MEMORY

Ted Huf, K4NTA

LINKING

In the summer of 1984 we started talking about high speed linking and how we would go about it here in Florida. We came up with a couple of plans that we called GATOR 1 and GATOR 2.

GATOR 1 was to be sort of a stopgap "smart" digipeater plan where we would use 220 mHz at 9600 baud to relay between two meter digipeaters. The idea was that the user could enter the high speed network with an AX.25 Level 2 TNC and cause his packets to be relayed across the network. The acks would still come all the way from the other end of the network, but there would be acking between nodes on the 220 network. GATOR 1 was only to be around until real Level 3 linking came along and then it would be scrapped.

Well, here it is a year later and we still don't have GATOR 1. At a recent meeting in Sebring, it was decided to not wait for radios and modems that would run 9600 baud and just get on with it at 1200 baud on 220 mHz. We felt that we could change out the modems and, if necessary the radios, when the time came.

Advances have been made on the software front, and while Howie Goldstein, N2WX, did a lot of work on GATOR 1, he has done even more work on Level 3 for the TNC 2. Now instead of the linking being GATOR 1 with its "smart" digipeaters, it will be GATOR 2 with real Level 3. I will not go into how it will work, but please read Howie's article in this issue of the BEACON.

TAPR ELECTION

Two of the major packet radio organizations in the country are FADCA and Tucson Amateur Packet Radio (TAPR). TAPR has done more to make packet radio popular than any other group, and we who have been members of FADCA for a while feel that TAPR has done a lot for the growth of packet radio around these parts. The man who started FADCA and has done more that anyone to get packet radio in Florida to where it is today is our President, Gwyn Reedy, W1BEL.

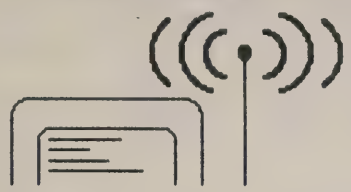
Florida should have someone on the TAPR Board of Directors. TAPR will soon be holding the annual election of directors. I urge all of you who are TAPR members to be sure to vote when the ballots are mailed and be sure to support W1BEL for TAPR Director!

Florida Packet Frequencies

LAN and calling freq: 145.010
Local QSOs & file xfers:
145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):
221.720, 221.780
Narrow bandwidth linking:
221.400 (20 KHz b/w)
Medium bandwidth linking :
220.570 (100 KHz b/w)

NOW THERE ARE THREE FROM BRINCOMM!

MACPACKET/TAPRterm

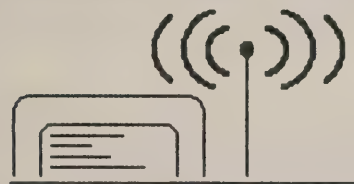


Version 1.1

By Jack Brindle, WA4F1B

← TAPR TNC 1
Heath HD4040
AEA PKT-1

MACPACKET/KANterm



Version 1.0

By Jack Brindle, WA4F1B

← Kantronics Packet Communicator™

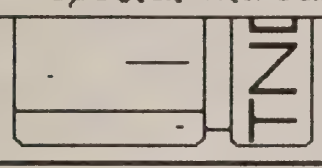
MACPACKET/TNC2term††

Version 1.0

By Jack Brindle, WA4F1B

← TAPR TNC 2

Special Introductory Price: $39.95†*



Copyright 1985,
Brincomm Technology

If you have any of the above TNC hardware products, Brincomm Technology has the Macintosh™ "front-end processor" software you need. MacPacket does the interfacing chores you hate, leaving you free to do what you like most . . . Packeting! Here are just a few of MacPacket's features:

- -Split Screen Display
- -Full Menuing
- -File upload, download, printing
- -Routing Tables for route selection

For information on ordering contact:

Jack Brindle
Brincomm Technology
2980 Wayward Drive
Marietta, GA 30066

New Address!

*Price includes all updates within one (1) year of purchase. Georgia residents please add 4% sales tax.

†Special introductory price of $39.95 for MacPacket/TNC2term until Dec. 31.

††Available early December.

Macintosh is a trademark licensed to Apple Computer, Inc.
Kantronics Packet Communicator is a trademark of Kantronics.

We Support FADCA!

Near the end of October, N4DNW and N2WX-1 connected to N2WX-2, a FADpad switch taking up beaucoup floor space. It was worth it though (the mess all over the floor) when Bill typed "CALL 031003057248782", and I printed this strange message "*** 031003057271234 COM" and we were linked through this monstrosity to each other. What's so special about that?

Nothing special, if you think doing away with end-to-end acking is boring. Cause once you do away with end-to-end acking, the network itself can worry about routes and flow control and such, and real boring things like Throughput and Multiplexing.

For the nth time, the digipeater system is a kluge, but one that works incredibly well. But if you use digipeaters, you've committed the TNC to figuring out (all the time) the condition of all of the paths it's using. That takes time, and channel capacity, and each digipeater that is used more than halves the sustained throughput that the physical link supports. Even under ideal conditions your TNC can send no more than about 1800 bytes of data before it must hear again about whether it should send more, or send it again.

End-to-End acking, on the other hand, ideally offers a circuit you can pump data into continuously at the link's capacity. This way after you offer 1800 characters, about seven frames worth, there is only a slight delay to hear from the local switch before seven more frames get sent. In a sense, this kind of network - specifically, Gator 2 - distributes storage space for your conversation - your "Call" - geographically throughout the network.

Multiplexing with Gator 2 is possible with TNC/PADs equipped for AX.25 level 3. Appropriately equipped users can "Call" many people at one time, or one person many times, or any combination. The interface for each logical channel is handled consistently as far as higher layers outside of the TNC/PAD are concerned.

HOMEBREW PACKET GATOR UPDATE

Howard Goldstein, N2WX

Okay so what does this mean? Well, FADpad is now really a PAD - a packet assembler/disassembler. True *packet* radio - not "frame" radio.

Gator 2 FADpad: The switch Bill and I used to call each other through was running FADpad software with one port/five links/five channels per link. The buffers use much less than the nearly 48K RAM not used by the software. A real switch with one port might have ten links, three for internet use between switches (supporting 20 calls each) and the other 7 links for LAN use (2 calls each). The other kluge we used was to transfer AX.121 addresses with the switch, at level 2 with PID 0xF0, so the stupid routing in this early version could figure out what do do when Bill's PAD sent the call request packet to the switch.

TNC 2: We both used TAPR TNC-2s set up for two links/two calls each, using less than 18K EPROM and 8K RAM.

Gator 2.0: Gator 2 uses a protocol similar to AX.25 level 3 between network switches. For simplicity, internal routing will probably be hardwired in EPROM, like the RATS (New Jersey) network initial approach.

Users will access the network one of two ways:

1 - If equipped with a "plain vanilla" TNC, connect to the local switch in the same way you normally connect to a local station. When you place a call through the network, you'll send and receive data, commands, and status indications through your level 2 link with this switch. Figure 1 shows how the network appears in this case. Note that only one circuit is available when no network interface exists between the local switch and the user's access node.

2 - If the TNC is equipped with AX.25 level 3, once you're linked with the local node you can place the second or nth call as naturally as the first. In effect, it brings the network to your shack, so to speak, and gives you easy manipulation of network parameters which might improve the call or the condition of the network. Figure 2 shows that the number of circuits a user can set up through one network switch is limited to about 4,100 (the protocol limit), or the implemented limit of the switch/network.

When will Gator 2 be available? With the switch code working on the air now, I'll be replacing N2WX-7 with the Gator 2 EPROMS and thrash it locally on the tall tower. It will continue to respond to MLB through the tests and act normally, except the /MLBLOG will not be available. Type "2" users of MLB will be able to conduct QSOs without digipeating, at least VIA MLB, and everyone else will be able to digipeat as before.

The interface for type "1" users is very important and will be installed once the actual network layer code seems to be working reliably, and the interface bugs can be seperated from network bugs.

A note - Since writing this report I've received more information on addressing techniques within the network layer. Coding the callsigns only regardless of whether the destination station is a type "1" or "2" will eliminate the need to type an entire AX.121NA address (an example of which appears at the front of this) in most cases.

Further reading:

AX.25 Network Sublayer Protocol Recommendation (Terry Fox, WB4JFI, 3rd ARRL Computer Networking Conference Proceedings)
Recommendation AX.121NA (J. Gordon Beattie Jr. N2DSY + RATS, 4th ARRL Computer Networking Conference Proceedings)

For review:

Reference model of Open Systems Interconnection for CCITT applications (CCITT, X.200).

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM EST. NCS: K4NTA. We are looking for a NCS in far north Florida or Georgia to conduct a session one hour later at 8 AM CST.

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 7:30 PM EST. NCS: KB4LLO.

BREVARD COUNTY AREA: 146.940 (-600) Sunday 8 PM unless Space Shuttle audio is being broadcast.

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

MARION COUNTY AREA: 146.61 (-600) Thursday 0045Z. NCS:K4OZS

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

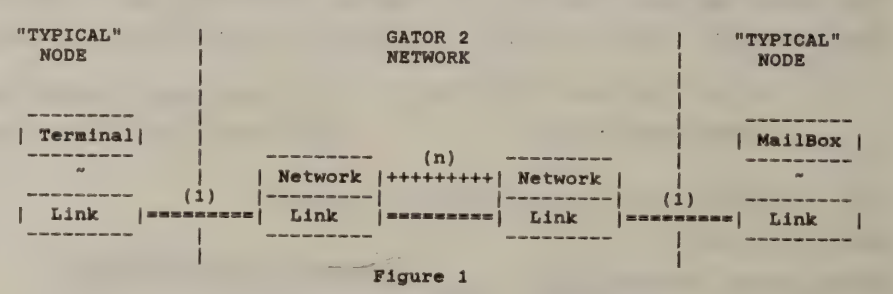


Figure 1

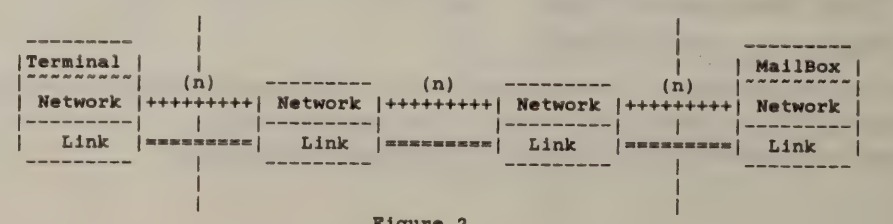


Figure 2

PACKET EVOLUTION

ANOTHER BREAKTHROUGH FROM AEA

Packet + RTTY= Pakratt™ PK-64.

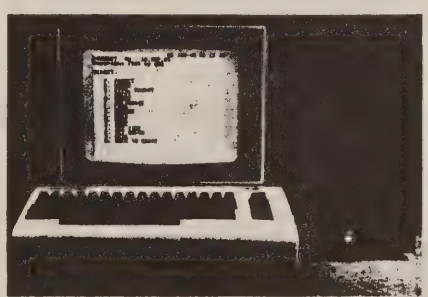
If you 've read about packet, or are already into it, you know how exciting it is. With the hot new Pakratt PK-64 we've just brought a new dimension to packet. The Pakratt PK-64 is a complete, fully assembled and tested packet radio controller which, together with a Commodore 64 or 128 computer, can convert your shack into a packet operations center.
And we've included a new version of our advanced MBA-TOR™ software to make it the first packet controller with AMTOR, Baudot, ASCII and Morse. But an even more exciting part of the Pakratt controller is its great price.

Incredibly Simple To Set Up

Just plug the Pakratt controller into the C-64's game cartridge slot, add a mic connector for connecting to your particular transceiver, and you're set.
If you're anxious to try it out, our new "quickstart" manual section can get you on the air in under ½ hour.

Simply Powerful

The versatile Pakratt controller shows messages and connect status simultaneously on your Commodore with a unique split-screen display. And it lets you



PK-64 shown with HF modem option. Computer not included.

send letter-perfect text from the text editor software while mon itoring incoming messages. The 20K byte QSO buffer stores more than 20 video screens of text! Disk commands let you save specific operating parameters for quick set-up for emergency services, clubs, and multiple frequency use. And the Pakratt controller's standard, TAPR style modem gives you 300 and 1200 baud operation with great HF/VHF performance.

We can't possibly list all of the important features of Pakratt here. But the absolutely best part of the Pakratt PK-64 is that it's at your dealer now. So stop reading, run down to your local dealer, and check Pakratt out. Because the real challenge will be to find one after the other hams see it.

Pakratt PK-64. Packet Power from AEA. At amateur radio dealers everywhere.

Advanced Electronic Applications, Inc.
P.O. Box C-2160
Lynnwood, WA 98036-0918
(206) 775-7373
Telex: 6972496 AEA INTL UW

Pakratt and MBA-TOR are trademarks of Advanced Electronic Applications, Inc. Commodore 64 is a trademark of Commodore Electronics LTD.

NETWORKING

Jack Brindle, WA4FIB.

This month we shall begin discussing the Network layer, otherwise known as layer 3. This layer has become the topic for much discussion in packet circles as we progress to true networking systems.

The Network layer is primarily responsible for packet routing, prioritization, and flow control within the network. The end user sees the network as a system that provides the ability to communicate with other end users. This is an important point to realize: that networking is a system function provided by the communications system that interconnects two end users.

As we noted above, the primary function of the network layer is to execute packet prioritization, flow control and routing. Communications at this layer is on a node-to-node basis such that each node sends commands to the next node that describe the proper way to handle the packet. This information is contained in the layer 3 header which is attached to every packet that flows through the network. Since network layer communications takes place only between two consecutive nodes in the network, each node will strip off the layer 3 header, use the data to determine how to handle the packet, then attach a new header and forward the packet towards its destination.

Packet prioritization allows important or time dependent data to take precedence over other less timely data. For example, data file transfers can take awhile to be carried across a link so they are assigned a lower priority than digitized voice that needs to be delivered quickly. Normal QSOs would also be given a higher priority to allow quick delivery of QSO exchanges. The priority of the data type is assigned at higher layers, but the network layer is called upon to implement the priority structure by delivering packets to the link layer in the necessary sequence. The packet priority is carried with each packet as it progresses through the network so that each node may properly handle the packets it receives in the most expedient fashion. This process must occur in each node since only that node knows the priority of the data it holds at any given point in time.

Network flow control is also handled at this layer in order to assure that each node's buffers do not overflow. Flow control is generally handled by allocating a number of buffers for the present transfer. This count is transferred to the sending node, which then proceeds to send its data. When it has sent a number of packets to fill up the receiving node's buffers it will stop, awaiting a new buffer allocation from that station. Only when the allocation is received can the sender continue. Note then that the receiving station should have adequate buffer space to allow it to hold the data before it can be forwarded to its destination.

The third major function in the network layer is packet routing. This is the most discussed function that the layer performs, but not necessarily the most important. The network layer provides the mechanism to transfer packets from node to node through the communications network using the best path available from the sending user to the receiving user. Path determination is generally direct from end-user to end-user using the least number of intermediate nodes, although the path should also be based on activity and loading of network nodes. Message rerouting necessitated by a defective node is also handled here to lessen or eliminate the loss of data. In a typical QSO, a user connects to the network to be able to communicate with a distant station. He then indicates to the network where the destination station can be found (this could be as simple as sending the destination call). The network node will then chose a path to get to the other end, based on its knowledge of the network topology and activity in the network. We will return later to discuss how it determines this information. The node now assigns a logical identifier to the path. This identifier indicates to the node the station that will receive packets for this link. The node relays the packet to the next node, which uses the logical identifier to determine the node it relays the packets to. This progression continues, with each node using the logical id to determine the next node in the path, until the message gets to the destination node. This node then delivers the packet to the end user. The path used is called a virtual circuit. The virtual circuit is made up from individual logical channels between each node in the path. There are two types of virtual circuits, a Permanent Virtual Circuit (PVC) which is made up at network configuration time, and a Virtual Call (VC) that is generated when a QSO is desired. The two are differentiated only by the duration of their existence.

PVCs are always in place while the network is operating, whereas VCs must be constructed when a QSO is desired. After construction, the two circuits are identical in use. The VC is "torn down" after the QSO, while the PVC becomes available for other users. Since virtual circuits may exist between any two nodes in the network, the number of PVCs grows quite large as the network expands. Also, as the network is expanded each node must be notified of a new node so that a new circuit is added to its "routing table." PVCs save time, however, since they are available for use at any time and need not be constructed before their use.

A third common networking method is called Datagrams. This method, commonly used in bus type hard-wired local area networks, attaches all information necessary to route a packet to the layer 3 packet header. This is similar to the method now used in AX.25 layer 2 where the call of each relay station is placed in the layer 2 header. This can make for quite lengthy packets as more nodes are required to reach longer distances. This is contrasted to the virtual circuit where the routing information is transformed to a logical channel from one end to the other. The advantage to the Datagram method is that each packet is self contained and can easily be rerouted in the event of a node failure or heavy loading in a network node.

One result of rerouting is the great possibility that packets will arrive out of sequence. This could be disasterous in file transfers! To combat this, a robust transport layer is required to reorder the packets and make sure all packets are properly received. Of course, virtual circuits require this service also, although not to as great a degree. Each networking type has its own advantages and disadvantages, and has spawned much debate in packet discussions. The possibility of great length of each datagram packet causes concern due to the long transmission times required and the extended possibility of collision or noise dropouts. Virtual Calls require time to build before they can be used, and thus add overhead to the connection process. Permanent Virtual Circuits require that the network be controlled from a central controller where the PVC routing tables are built each time a node is added to the network (of course, the tables then can be transferred to each node by using the network itself).

So when will the network layer finally stabilize? Several groups are currently pursuing each method, and many "experts" continue to argue the merits of each method. It appears that the saying "he who codes, rules..." will prevail here, and the first system to come into existence may become the standard. The intricacies of the network require much consideration so that we do get a viable network that will satisfy packet radio for years to come. Next month we will move to the Transport layer to discuss its importance in user-to-user communications.

JUNKBOX

FADCA has 8530-A SCC chips which are used on the FADboard with the Xerox 820 to give a dual HDLC output. These are high speed 6 MHz parts. Only $20.00 postpaid.

The FADCA modem kit provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. The price is $8.95 postpaid from the designer and producer:

Jerry Quimby (N4AJH)
601 Verbenia Drive
Satellite Beach, FL 32937

FADCA badges are now available. Badges are 2 1/4" round with locking pin on backside. $1.00 without call letters, $2.00 with. Colors available are yellow, gold, salmon and blue.

ALL parts are available for the TAPR/AEA/Heath TNC including 1935s and 2212s. Contact Bob Boyce, KB4IQM. (305) 967-9999. (24 hours).

INTRODUCING THE
PacComm TNC-200

TNC - 200 CMOS 169.95 NMOS $ 154.95

This is a licensed, exact copy of the TAPR TNC2. Includes all parts, EPROMS, cabinet, Assembly, Reference and Operator's Manuals.

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Same as the TNC-200, without the cabinet and Reference Manual.

PC2-HTF CMOS 84.95 NMOS $79.95

TNC-200 printed circuit board, hard - to - find parts, EPROMS, and Assembly Manual.

PC2-BD $39.95

TNC-200 printed circuit board and Assembly Manual. Double-sided, plated through holes, silk-screened, solder masked, computer tested for shorts and opens.

PC2-CAB $29.95

TNC-200 aluminum cabinet, end plates and hardware. Exact copy of TAPR TNC2 cabinet in PAC COMM colors and end plate design.

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Andy Demartini, KC2FF

Gwyn Reedy, W1BEL

MEMBERSHIP CONTEST

FADCA is running a membership contest from now until January 31, 1986. The rules are simple: The person that enrolls the most new FADCA members during this period will receive a TAPR TNC2. There will be prizes for second and subsequent places too. Credit is awarded based on the contestant's name or callsign on the new member's enrollment form. The new member also gets credit for his own enrollment.

So, get busy. Make some copies of the membership form in the September issue, or send an SASE to FADCA for a new supply (Say how many you need). Be sure to read the item below about 1985 dues rates. Show your BEACON issues to your friends, show them the article about PACKET RADIO MAGAZINE, get them to do themselves a favor by joining FADCA, and help yourself to that TNC2.

EXPLANATION ABOUT FADCA DUES

FADCA dues are run on a calendar year basis, (January to December), rather than being based on the anniversary of the month each member joined. This procedure really simplifies the book keeping, but is not really fair to those that join late in the year. We understand that you won't be happy to join and have send another full year's dues in just a month or two, even though you just received a large package of back newsletters.

Therefore the dues policy will be as follows. Members joining in October or later will receive a discount on 1986 dues according to the following table:

Joining Month	1985 Dues	1986 Discount	1985/6 Total
October	$12	$3	$21
November	$12	$5	$19
December	$12	$7	$17

An alternate plan is to specify that you do not desire the back 1985 issues. In that case, add $1 to the 1986 dues for each month of 1985 membership desired, e.g. November = $14, and December = $13.

Dues for 1986 were set at $15 by the Board of Directors, but the $12 rate will be continued through January 31, 1986 for both new members and renewals. (Above table based on payment before Jan 31st.) That date coincides with the end of the membership contest. Renewal notices will be mailed out approximately January 2nd.

DRNET
M 3628 John Gates -NAPRA-(N7BTI, 2988) 10/15/85 2:13 AM L:5
KEYS:/SCATTER/6 METER/

Am looking (on behalf of WA7ETE, Steve here in Seattle) for anyone interested in working packet on 6m meteor scatter. Steve wants folks about 1000 miles from Seattle. If you are interested or know of anyone please let me know on DRNET.
Regards, John

MIDLAND 13-509 RADIO MODS FOR USE WITH K9NG MODEM

TOM KING, KA6SOX

1. Heatsink TR21 (driver output on exciter).
2. Replace capacitors 112, 113, 119, 120, 124, 134, 135, 140, 141, 191, 194, 198, 199, 201, 202, and 204 with 1000PF silver micas.
3. Replace C13 & C18 with Pizeotech 2194F 2 pole 10.7 MHz filters.
4. Replace C71 with 120 PF silver mica capacitor.
5. Update TR1 AND TR2 with 3SK45'S or replace with 3SK51'S for better performance.
6. Replace CF1 with a MURATA CFU-455C filter (wider filter to allow up to 3 KHz offset).
7. Replace C176 with the modulation circuit described in K9NG'S paper.
8. Add a crystal oven to the transmitter crystal and MV2114 diode (they both need temperature stabilization).
9. (OPTIONAL) The installation of a quadrature detector yields a 3dB better recovery of signal and is recommended (boards should be available in Nov).

NOTE: Items 1 through 5 supplied by the CONDOR CONNECTION, a statewide network of 220mhz repeaters that are open for anyone to use. That group has taken the midland apart and run extensive tests on how to make the radio live as a duplex repeater on a mountaintop.

I will try to get a schematic of a cheap crystal oven to place over the xmit crystal and varactor diode. I will also try to get schematic of a PIN diode switch for it. 73's Tom, KA6SOX

FADCA SOFTWARE LIBRARY

The FADCA software library is operated by Howard Fisher, N4KPU. The library specializes in public domain software oriented to the amateur using digital communication methods. When in full operation, the library will provide a full suite of Xerox 820 software, CPM and MSDOS development tools and terminal programs etc. There will be limited support for Commodore 64 and other popular computers, also.

Howie has the ability to do both 8 inch CPM and 5 inch MSDOS formats, as well as most Heath H-89 supported 5 and 8 inch formats. He will have access to equipment producing Kaypro and C-64 disks, and possibly other brands. If we can work out all the arrangements, he will be able to provide EPROMmed software also. Charges will be nominal and intended only to cover operating expenses. Any excess funds will accrue to FADCA.

Please send your software contribution to Howie at the address below. Provide whatever documentation you can on the diskette and include your name and address as well.

Howard Fisher, N4KPU
3191 Willow Rd.
Wimauma, FL 33590

TNC-2 PROBLEMS

11/05/85
To: ALL, please give wide coverage
Fm: TAPR
Re: Problems with TNC 2 rev 2.

The first of the second shipment of TNC 2s has hit the field, and some problems have been identified.

The following information applies only to TNCs with an ORDER NUMBER greater than 511, those that say Rev 2 below U21.

Symptom: During the test on page 44, the STA light fails to go out.

Solution: The manual fails to tell you to install U24, the second 6264-L. Remove power and install this chip.

Symptom: The digital loopback test on pages 47 & 48 fails. No CONNECTED message is displayed.

Solution: SOME, not all, of the state machine proms (U6) were programmed incorrectly. To see if this is your problem, perform the following steps:
1) Remove power
2) Remove U5(74HC374) and U6(2764 marked STATE) and place on the black protective foam.
3) Install a jumper between U21 pins 13 and 14.
4) Install a jumper between U21 pins 12 and 15.
5) Check for shorts.
6) Apply power, try digital loopback test again.

If the test succeeds, you have a bad U6. To double check, swap U6 with any other working state machine, either from a TNC 2 rev 1 board, a working TNC 2 rev 2, or the K9NG 9600 baud modem board.

If your U6 is bad, put it on a small piece of the black foam, put the chip and foam in the small box your sockets came in, and send the box back to TAPR. We will return it asap by first class mail.

Symptom: Your front panel is missing.

Solution: No one got one. A sheet notifying you of this was left out of the box. The panels will be sent to you via first class mail by the end of the week.

Symptom: Your board says Rev 2, but the manual says Rev 3.

Solution: Replace Rev 3 with Rev 2 in the manual. There is no Rev 3.

We apologize for these problems. Remember, the preceding applies only to TNC 2 order numbers greater than 511 (rev 2). Owners of TNC 2 rev 1 (order numbers less than 512) will want to be sure to see the next PSR, it contains information on how to upgrade your TNC to rev 2. PSR should be mailed in the next 7 days.

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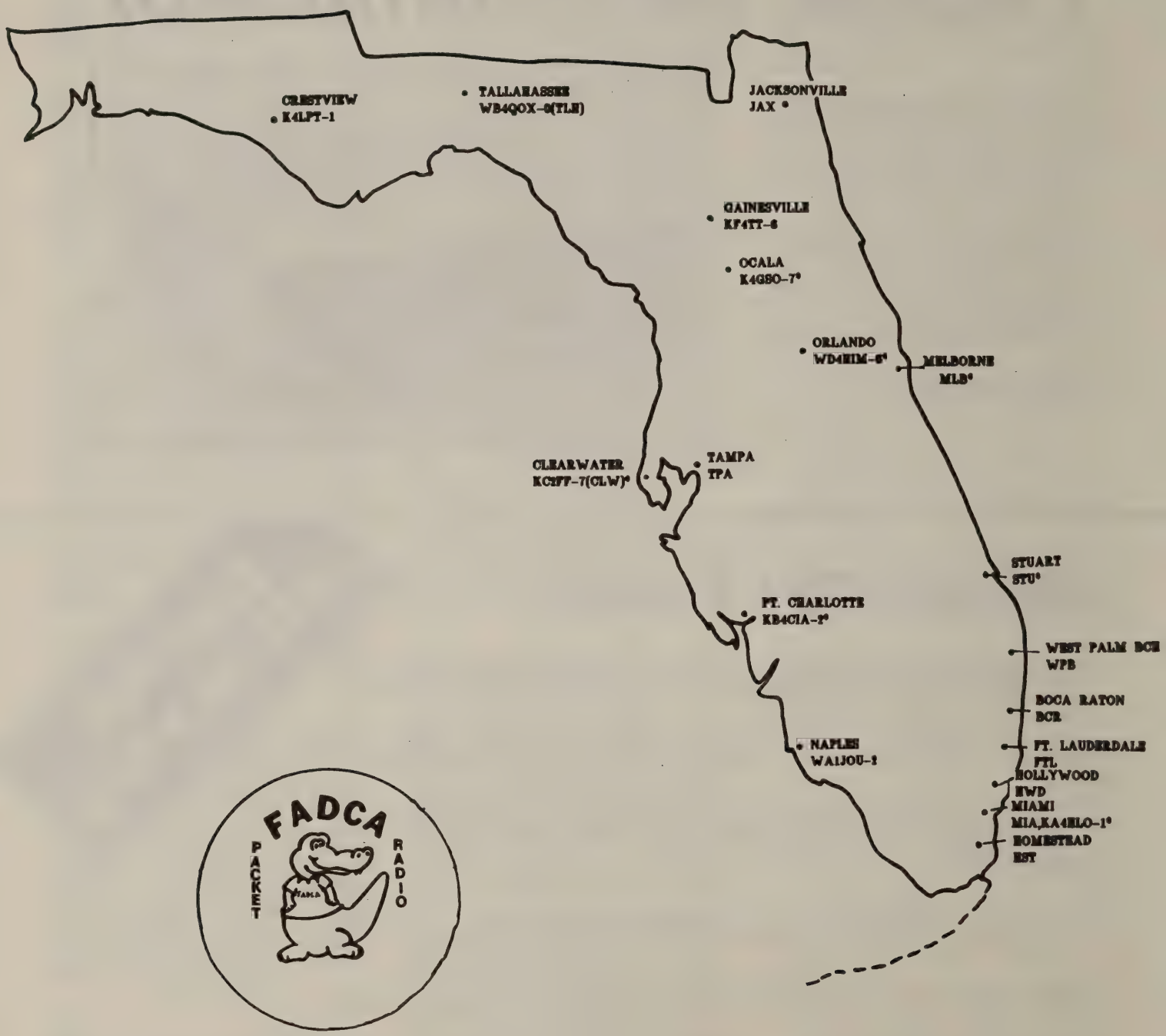

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DRNET
C2973 CC38 Phil R. Karn (ka9q',2979)
11/ 7/85 2:28 AM L:43
KEYS:/TCP WORKING!/

I am happy to announce that my TCP code is functional. I successfully carried out its first real workout tonight in a "QSO" with my vax at work. The path looked like this:

IBM PC/XT -- my code, originating end of TCP connection
1200 baud asynch port (using SLIP for datagram encapsulation)
Ven-tel 212 modem
dialup phone line
Penril modem (company modem pool)
Micom data switch
T-1 interlocation link
Micom data switch
1200 baud asynch hardwired line
asynch interface on my office SUN with SLIP driver
SUN Workstation running 4.2BSD; acts as IP gateway
3-Com Ethernet interface
Local area network
3-Com Ethernet interface
Inter-Ethernet IP gateway (another SUN)
3-Com Ethernet interface
Another local area network
3-Com Ethernet interface
VAX-11/780 running 4.2BSD --- other end of TCP connection

The whole setup worked remarkably well. Of course, the slowest part of the path was the dialup phone line. I noticed that the line was fairly noisy. Whenever a SLIP-encapsulated IP datagram was sent over it after the line had been idle for a while, I noticed that it would often not make it through. This is because SLIP does not put any framing characters on the beginning of a datagram, only at the end, and should a noise character occur between datagrams, the datagram that follows will have it tacked on to the beginning. Of course, the checksums at the IP level detect this and discard the packet, which TCP later retransmits.

For demonstration purposes, it would be trivial to replace the modem link with a pair of TNCs so that SLIP-encapsulated IP datagrams could be sent over the air without worrying about the AX.25 I-frame boundaries. Of course, since Dave Mills has already beat me to the first TCP/IP contact over AX.25, I don't see much point in duplicating that demo...

Phil

TO: ALL

FM: BILL WB2CPV,
SOUTHNET CONFERENCE COORDINATOR

RE: RESERVATIONS

FOR THOSE OF YOU WHO ARE INTENDING ON COMMING TO THE SOUTHNET II CONFERENCE IN NOVEMBER THERE ARE TWO HOTELS THAT ARE CLOSE TO THE SITE OF THE MEETING. THE HARVEST HOUSE (404-892-6800) AND THE PIERREMONT PLAZA HOTEL (800-531-6660). WE HAVEN'T BLOCKED ANY ROOMS DUE TO THE POTENTIAL PROBLEMS (LOSS OF BIG BUCKS) BUT RESERVATIONS CAN BE MADE THROUGH EITHER HOTEL. BE SURE TO MENTION THAT YOU ARE ATTENDING A CONFERENCE AT GEORGIA TECH TO GET A SPECIAL RATE.
!!!!!! SEE YOU THERE !!!!!!!!!!

COMPUSERVE HAMNET
#: 33349 S9/Packet/RTTY/AMTOR
02-Oct-85 23:02:32
Sb: PACKET NETWORK
Fm: RICHARD DUNCAN 71515,1420

I am located in West Memphis, Arkansas and several hams in Memphis, N.W.Mississippi and N.E. Arkansas are on 145.01 with packet. I am interested in contacting other groups in the Central states area (AR, TN, MS, LA, etc) to work on establishing a good network. Presently we have a net from Hernando, MS to Blytheville, AR with an occasional link into St. Louis when the conditions are good.

I would like to start a "Central States" association with various clubs and individuals in these states to exchange information and ideas along with a coordinated effort in establishing a good network in this area. If you hear of anyone interested please send them my way. I would also like to hear from other groups and work toward a Gateway here for H.F. linking into other networks.

Also, if there is already an organization covering this part of the world I will humbly bow to them and offer them any assistance I can, otherwise word processor here I come!

Richard Duncan WB5CNV
2504 N. Gathings Drive
West Memphis, AR 72301
Voice: 501/735-6086

I wrote the CoBBS software for the TRS-80 color computer and it is online 24hours a day at 501/735-5614 (300 and 1200 baud).
Best of Conditions, Rich

COMPUSERVE EASYPLEX
Date: 03-Nov-85 17:49
From: Tom K4GFG [75046,1224]
Subj: This and That

Don suggests, and I agree that we need to formalize this AUX LINKING group in order to pull off wide-scale linking by March or sooner. I see this group as separate from the FDC (FADCA Digipeater Council), but similar to the old linking committee FADCA had. We need software, hardware, and RF people to figure out just what it is we are going to do. As I see it, a state of near anarchy rules the AUX LINKING now, with people being told to get radios and 820's and GO! But they will need help, and someone to call when they have hardware, software, or RF problems.

Further, at some point, don't we need to be less open about our AUX LINKING? If we are to keep from suffering interference from end users of the network, we can't go broadcasting the frequency, baud rate, protocol, etc that we are using. Only network (digi) operators need to know this. Most people who install AUX links for their repeaters don't go broadcasting their link frequencies. What are your thoughts on the need for more secrecy versus the desire to inform people of progress? Maybe there is no need for the packet community in general to know a lot about the fine details of linking.

73's...Tom

COMPUSERVE HAMNET
#: 33155 S9/Packet/RTTY/AMTOR
26-Sep-85 02:19:41
Sb: tnc-1
Fm: Harold Price, NK6K 71635,1174
To: all

Many people have asked for a TNC 1 status report. Here is a short one. As many people know, the problem lately has been the lack of ability of getting the 4165 lines of Pascal compiled to 6809 code. The actual 4.0 code itself has been tested under Turbo Pascal on an IBM-PC and is running fine. In addition to fixing all of the bugs reported in 3.x, it implements multiple connects (up to 37 depending on the amount of ram you have), and most of the new features written up last year and "voted on" by packeeters. Many of those were also implemented on the TNC 2. Most of the new things Howie added for TNC 2 have been included in 4.0 as well. The goal is to have TNC 1 and TNC 2 have compatible command sets. The nice side effect here is that the AEA PK-1 and the Heath HD4040 will also run the new 4.0 code. My fervent wish is to have 4.0 on display at the TAPR booth at the national convention. It should have been ready this weekend, but developing code in the unfettered IBM-pc memory environment allowed me to get away with a bit of sloppiness, i.e. I'm pushing to much on the stack. THis should be fixed when I return from the CRRL national convention this weekend. Keep your fingers crossed for good news. HP

Msg# TR Size To From @ BBS
Date Title
1798 N 1711 W1BEL K4AHO
851105 2211 Sens.

Dear Gwyn,
I have been hearing a rumor that the EXAR 2211 chip showed a variation of sensitivity from chip to chip. I never really was convinced that was the case. Well the TNC-1 that I am using for the permanent digipeater suddenly lost sensitivity earlier this year. It was an extreme case. My old TNC-1 I have been using from the first will light the Data Carrier Detect (DCD) at 10 mV input to the chip. The digi TNC-1 required 150 mV to trip the DCD. A litle troubleshooting with both TNCs side by side showed the pin 3 loop filter voltage responding radically different to a 1700 cycle tone fed to the inputs of the TNCs. Further investigation revealed the .1uf ceramic cap on pin 3 was open. Also discovered in conversation with an EXAR applications engineer that the input preamp can be desensed by a resistance from pin 2 (input) to ground. The response is extreme. A resistance of 1 meg will reduce the sensitivity from 10 mV to aproximately 120 mV to trip the DCD. This means that any leakage of the ceramic cap on the 2211 input will quickly reduce the sensitivity. I replaced both ceramics on pin 2 and pin 3 with a poly film cap and the sensitivty came back to normal. What a relief... Bottom line; if you have any suspicion of the sensitivity of the 2211 chip, the first order of business should be replacement of C23 and C25 with a film type capacitor of 100 volt rating. That will probably cure the problem.
Later, Jim/ K4AHO

COMPUSERVE EASYPLEX
Date:08-Oct-85 23:44
From:Pat Fagan WA5DVV [74246,1310]

Hello Gwyn! Glad to see you on here too. I am planning on seeing you at SOUTHNET II. There is now a wide area DIGI in Gulfport, MS. It is using GPT for routing access. How is that going in Florida? Have you had much success with the FADCA group going to this format on the FL Digi's? Also, there is now a Digi in Baton Rouge, LA. The call is K5GUU-1. The only WORLI MailBox in a three state area is also in Gulfport. I am running version 10 software here at WA5DVV. The MARDA group (Mississippi Amateur Radio Digital Association) is sponsoring the MailBox (GateWay coming soon) and Digi in Gulfport. Plans for a Digi near Jackson, MS are underway. That's about all for now please stay in touch. Packet Demo next month at Hattiesburg ARC and Picayune ARC presented by MARDA. Jackson County ARC already introduced to Packet. Mississippi Coast ARC had Packet Demo at their 9th annual HamFest October 5 and 6. Jon Bloom, KE3Z, was our guest speaker and was at the MARDA booth both days to answer questions. Packet is going strong in Mississippi. Had TNC-2 on display and WA5DVV MailBox running WORLI software. CUL & 73. Pat.

COMPUSERVE EASYPLEX
Date: 19-Oct-85 01:05
From: Patrick J. Fagan WA5DVV
[74246,1310]

Hello Gwyn! Good to hear from you. MARDA is growing in a big way. There is now a DIGI in Columbus, MS. KC5RY-1 is on the air and a connect has been made last week when the band was open. That now gives us a total of two DIGI's in Mississippi. I can't remember if I told you about the Slidell, LA DIGI. The call is now SLI (was WB5BZE-1) so please make the necessary change. K4LPT-1 in Crestview, FL should be back on the air with a new antenna in about two weeks after suffering an outage from a lightning strike. WD5IKD, Alan is now on from Jackson, MS. Connected last week during the opening but nothing regular until we get another digi in between. 73 and see you at SouthNet. BYE

DRNET
M 12380 Pete Eaton (WB9FLW,2970)
11/ 9/85 9:44 PM L:21
KEYS:/IMPORTANT INFORMATION FOR ALL TNC 2 OWNERS!/
To: All
From: TAPR

Feedback from the field has shown two serious problems that ALL TNC 2 owners should be aware of!

If the Lithium battery is not mounted flush against the board and/or the PC board is warped it is possible that the case can be shorted to ground. All owners should insulate the top of the battery with a piece of electrical tape.

Notice to owners of Radio Shack Model 3 and 4 remove R 14, 15, & 16 these resistors have been shown to draw excessive current to the point of damaging the board! Please open your unit and make this modification immediately.

COMPUSERVE HAMNET
#: 33459 S9/Packet/RTTY/AMTOR
06-Oct-85 14:13:37
Sb: Packet Terminal Pgm
Fm: George T. Baker 70467,1337
To: all

The Texas Packet Radio Society (TPRS) is making available on a contribution basis the new Commodore 64 packet radio terminal program called "TNC64". This program converts the C-64 with 1541 disk drive and optional printer into a dedicated packet radio terminal. It was developed specifically for packet operation and contains several features provided for the convenience and efficiency of the packet operator. Full disk and printer support are provided, together with a 50,000 character capture buffer. Beta-test versions of the program are presently in operational testing; features include timestamping of the capture buffer and keyboard macro operation. Key macros permit lengthy connect statements with several digipeater specifications to be entered with only three keystrokes, as well as lengthy beacon text and other keyboard text strings. TNC64 provides several features for telephone terminal (BBS, etc.) operation as well as packet operation. Contact TPRS at P.O. Box 831566, Richardson, TX 75083-1566 for details on securing TNC64.

COMPUSERVE HAMNET
#: 32167 S9/Packet/RTTY/AMTOR
01-Sep-85 19:55:15
Sb: TNC 2 Troubleshooting
Fm: Steve Goode K9NG 70525,364
To: All

If you have an early TNC2 (rev 1) and suffer from interference to your radio gear, try the following:

1) Keep your antenna outside away from any digital gear in the shack. This is always the first step.

2) 29th harmonic of 2.4576 MHz output of divider U4a is 144.9984 MHz. If the crystal is slightly high in frequency (4.9156 Mhz instead of 4.9152 MHz), this spur will fall on 145.010. Solution is to increase the value of C47.

3) Adding a 220 pF capacitor across U4 pins 3 to 7, a 100 pF capacitor across U10 pins 12 to 7, and a 0.01 uF capacitor across U4 pins 6 and 7 will aid in reducing spurious rf.

The October issue of Packet Status Register (TAPR's quarterly publication sent to all members) will have detailed information on TNC 2 based on field experience and lab analysis.

Keep the bug reports coming, and thank you for your support.
73, Lyle WA7GXD & Pete WB9FLW

1390 Y 355 W1BEL N4LXI
851017 Article
Gwyn,
I just got through reading your "Living together" article and wanted to tell you I felt it was very perceptive. It made me think of a lot of things that I think most of us forget. And that is the way commericalism effects grassroot movements like packet radio. Anyway I really enjoyed the article and PLEASE !! keep up the GREAT work.
Lee

COMPUSERVE EASYPLEX
Date: 04-Nov-85 19:27
From: Tom Kneisel, K4GFG
[75046,1224]
Subj: Linking RF Hardware Evals.

OK...here's what I have so far after today's discussions:

Hamtronics	TA51 + PA220	K9NG
	Midland + PPA220	KA6SOX
	R220	KA6SOX
	R76	-----
GLB	415A Rx Front End	K4GFG
	GLB-T Tx	K4GFG
Advanced Receiver Research		K4GFG
Sprectrum International		K4GFG
Lunar Electronics		K4GFG
Mirage		KA6SOX
Spectrum Communications		KA6SOX
Maggior(sp?) Labs		KA6SOX
Falcon (amplifiers)		----

Comments or additions? Steve, you want to contact Falcon maybe, to see what they have in amplifiers?

I would like people to know that "we are evaluating the suitability of several commercially available radios for high speed linking." Don't want people to think nobody is working on the problem.

COMPUSERVE HAMNET
#: 33485 S9/Packet/RTTY/AMTOR
07-Oct-85 19:00:14
Sb: #33477-Tono Theta-777
Fm: BILL KRASKI 71076,422
To: Richard Stump KD5VV
70165,130 (X)

THE THETA-777 ISN'T CHEAP, BUT IT REALLY DOES A JOB! IT WILL SEND AND RECEIVE CW, ASCII, BAUDOT, JAPANESE MORSE, AMTOR, SITOR AND BIT INVERSION. IT'S ALL SOFTWARE DRIVEN AND ALL YOU HAVE TO ADJUST FOR IS THE SHIFT, PAYING ATTENTION TO THE MARK AND SPACE LEDS. ACCORDING TO THE MANUAL, THE TERMINAL PROGRAM THAT COMES WITH DOS SHOULD WORK FINE. I INTEND TO TRY USING A TELECOMMUNICATIONS PROGRAM CALLED MITE TO SAVE WHAT I RECEIVE TO DISK.

SINCE I'M STILL TRYING TO FIND TIME TO STUDY FOR MY HAM TICKET, I CAN'T TELL YOU ANYTHING ABOUT ITS SENDING CAPABILITIES, BUT THE THETA-777 TRANSLATES RECEPTION LIKE A CHAMP.

Msg# TR Size To From @ BBS
Date Title
1639 Y 808 W1BEL K5TAN
851026 KANTRONICS PC-1

I am new to packet, so have not yet joined FADCA but will send application soon

I saw the latest newsletter printing my message about the difficulties I was having with my PC-1. I imagine you have also seen my follow-up message which indicates that the problem does not appear to have been in the PC-1 although it sure looked like it in the beginning. Apparently the other TNC was dumping part of its transmit and receive buffers and it looked like the PC-1 buffer was at fault. I have not been able to duplicate the problem unless I am talking to a GLB board. TNC-1 and other PC-1s seem ok. Would appreciate it if you clear up the issue in the next letter, as don't want the PC-1 to get any undeserved bad press. Thanks and 73 - Al K5TAN

FADCA > BEACON

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Publisher and Editor - Gwyn Reedy, W1BEL
Layout Editor - Brad Voss, WB8ZPE
Mailing labels - Jim Homan, W4DPH
Postal Expense Support - Phil LaMarche, W9DVM
...And lots of help from many authors. Thanks!!

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The DEADLINE for submissions for the DECEMBER issue of the FADCA > BEACON is NOVEMBER 29th. Articles should be in final form using a 35 character column width. Authors should request a style sheet from the editor.

DIGITAL EVENTS

NOV 23/24	Second SOUTHNET Packetfest hosted by GRAPES. A great weekend at Georgia Tech in Atlanta. Contact WB2CPV.
NOV 30/DEC 1	Broward Hamfest.
JAN 11/12	Sarasota Hamfest.
FEB 8/9	Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park.
FEB 22	Martin County FREEFEST in Stuart.
MAR 1	Hernando County Hamfest in Brooksville.
MAR 7/8/9	Orlando Hamcation. The Third SOUTHNET Packetfest in conjunction with the 5th ARRL Computer Networking Conference.

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DEMONSTRATIONS OF ALL CURRENT TNC HARDWARE
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AWARDS FOR SOUTHNET PACKETEER OF THE YEAR
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PROGRESS OF DIGIPEATERS IN SOUTHNET REGION
9600 BAUD MODEM PROJECT UPDATE
220 MHZ LINKING PROJECT STATUS REPORT
NETWORKING PROPOSALS AND WORKSESSIONS
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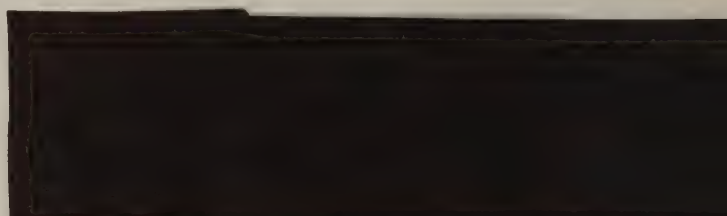

FADCA > BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

Vol. 2 No. 12 Brandon,Florida December 1985

SOUTHNET II

Eric Ellison, N4CI

The SOUTHNET II meeting was held on November 23rd and 24th on the campus of Gerogia Tech in Atlanta, Georgia. About 150 people attended from as far North as Wisconsin and West as Mississippi. All authors are to be thanked for their presentations. The conference was broken down into three sections for Users, Advanced Packet Techniques, and State Organizations:

THE USER SECTION

The user section was directed toward beginners. Pete Eaton, WB9FLW, presented the now famous "Pete's Packet Primer." TNC user demos were provided by Pete Eaton on the TAPR-2 TNC, Tag Spivey, N4EMM, on the Kantronics Packet Communicator, and Jim Griffith, WB5RAX, on the AEA PK-64.

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SOUTHNET was a success by any measure and its attendance from over the whole region very gratifying.

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A demonstration of hi-res picture transfer and suggestions for voice transfer by Buck, K4ABT, and Glynn Rogers, WB4RHO. Buck has been transferring digital images for the past 6 months using Radio Shack Color computers. During one of the recent hurricanes to hit Florida, Buck was downloading weather satellite pictures and relaying them over packet radio on 145.01.

Doug Drye, KD4NC, presented a primer on basic networking with current alternatives. Doug has an excellent color slide presentation. John Smith, KI4XO, presented a program on the WORLI MailBox/GateWay system followed by a discussion on the use of the system on VHF and HF. John has worked with Hank, WORLI, on the software over the past several months. John and Doug, KD4NC, are working on versions which will be used in a Georgia MailBox/Gateway "Network" system to provide an interim network in the State as of January 1,1986. John took suggestions for software modifications to the MailBox/GateWay and distributed current versions on 5 and 8 inch media.

Chet Lambert, W4WDR, Publisher of Computer Trader Magazine (CTM), gave an update on the CTM Packet Radio Contest. Chet explained that plaques would be awarded instead of prizes offered earlier. Chet mentioned that he would offer CTM as

Continued on page 5.

TWO METER DIGIPEATER NETWORK OPTIONS

Ron Bentley, WA1JOU

We are currently experiencing some adolescent growing pains on 145.01, in that we are having difficulty in getting our packets through with even moderate load levels on the system. A variety of solutions have been proposed or are being implemented.

For instance, there is a strong push to get the 220 high speed links up to relieve the pressure.

There have been some complaints about BBS's and subsequent speculations that their use of .01 should be curtailed or restricted. The main problems have usually been stated to be either inter-BBS file transfers or the novitiate packeteer who develops a craving for "file transfer dx'ing". A voluntary shift to early morning hours for BBS transfers has eliminated the first problem, but a residual amount of the second is still present.

Still other folks, like the Miami users of HLO, have decided that a workable answer to their local communications needs is to simply have the digipeater on 145.09.

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what would be the effect if the .03 digipeaters were frequency agile?

****

All of these responses have merit but there has been a limited number of comprehensive proposals for improving the statewide system, within the constraints of the two meter band.

The .01 digipeaters are currently operated at critical spacing or even a little further. HST is a fine digipeater, but you cannot exactly say that there is a lot of link margin to JOU-2 in Naples. The temperature and humidity levels over the Everglades are major factors in determining whether or not you can communicate over this path.

A similar situation exists throughout the majority of the state, with many of the inter-digipeater links being of a marginal nature. Under these conditions the loss of a single node has an immediate impact.

One solution would be to double the number of .01 digipeaters. The immediate benefit of doing this would be eliminate the liability of system breakdown due to the loss of

Continued on page 7.

NEWS AND VIEWS

Gwyn Reedy, W1BEL

The SOUTHNET II Conference was very useful and enjoyable. The GRAPES folks did an outstanding job of making all the arrangements for the facilities and the recruitment of speakers. Eric, N4CI, has an excellent summary elsewhere in this issue.

I was able to have a long talk with Eric about the GRAPES organization and the congestion on 145.01 in Georgia. He reports elsewhere in this issue on the plan that has been adopted to further organize the state and temporarily limit congestion.

****

The real answer to congestion is greater network capacity.

****

Several factors have made this plan (or some plan) necessary in Georgia. Packet activity started there more recently than in Florida, and has therefore grown at a faster rate. Several groups (3 or 4) sprang up to represent local packeteers based on early centers of packet activity. I have heard the comment made by several Georgia leaders that they desire to move toward the "federation of LANS" structure that typifies FADCA. The GRAPES 'PNA' agreement establishes a mechanism for the various local organizations (and unorganized areas) to participate in a statewide organization. This will facilitate interaction with the state repeater council much as FADCA has been able to deal with the Florida Repeater Council.

The second problem Georgia faces that is dissimilar to Florida is geographic in nature. Whereas Florida's most populous areas are coastal, Georgia (and especially Atlanta) is central to the heavy packet activity in the Southeast region. That location, plus the existence of mountaintop digipeaters, has made congestion on 145.01 MHz a severe problem. The interim linking plan adopted for Georgia at SOUTHNET II is a way to use 145.01 as a backbone linking frequency uniting LANs on other frequencies until 'real linking' can be introduced. The plan's author commented several times that his proposal was a substitute for the linking plans existing in Florida because human and financial resources are not yet available in Georgia to implement a linking system on other than two meters.

Continued on page 3

GEORGIA PACKET NETWORKING AGENT PROPOSED AGREEMENT

This agreement resulted from 2 position papers produced by Eric, N4CI, proposing an organizational structure based on Primary and Secondary LANs. In the near future we will be entering a phase of "user growth" having passed the "early adoption" phase of packet radio. New users will be uninformed about the network and relativly uninterested in networking. Current usage of 145.01 is/was a kludge to get packet going. As we enter the growth phase of packet radio, we need to redirect our thinking to prepare the way for true networking when it becomes available. If we do not coordinate our efforts to provide a smooth entry to new users and a bed for networking experimentation, growth will level off in a state of confusion. The "networking" solution proposed will not fit all areas but the LAN organizational model may provide some guidance for controlled growth in packet radio.

This proposal provides for statewide organizational structure based on Primary LANs which are geographically assigned 145.0X frequencies with not more than 3 digipeters per LAN (to avoid parallel trunking.) Each Primary LAN Will have a LAN Coordinator to serve as a representative on a State PNA (networking committee). The PNA provides representatives to the SOUTHNET Coordinating Committee and interface with the state repeater council. The PNA approves all Hi-site digipeaters, plans for future LAN needs by monitoring the increase of new users, educates new users and assigns them a LAN of primary residence.

As of Jan 1, 1986 the State of Georgia will be divided into 7 Primary LAN/ administrative areas. (See Figure 1.) No high volume automated servers will be approved on 145.01. All new unattended digipeaters will be approved and coordinated. Connectivity between LANS will be initially provided by WORLI "NNCs", until a higher level of networking is available on a statewide basis. No user connects will be allowed to WORLI "NNCs" on 145.01. The 145.01 "Trunk" will be used on a shared basis by users and store and forward (S&F) traffic from the WORLI "NNCs". Allocations are automatic inter-LAN S&F traffic from 1.00 A.M. to 6.00 A.M (local time) and 9:00 A.M to 4:00 P.M. daily. Unsupervised user access to the 145.01 trunk is from 6:00 A.M. to 9:00 A.M. and 4:00 P.M. to 1 A.M. daily. Category 1 and Category 2 Secondary LANs are also defined as LANs within the Primary LANs geographic administrative area. A tentative "Ideal" 145.0X simplex LAN giving RF inter-LAN isolation is defined. It is thought that this written proposal might provide a model for other areas experiencing uncoordinated growth. A copy of the original proposal can be obtained by sending $1.00 and an SASE to GRAPES at PO Box 1354, Conyers GA, 30207. de N4CI.

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We Support FADCA!

FADCA MEMBERSHIP CONTEST

FADCA is running a membership contest until January 31, 1986. The rules are simple: The person that enrolls the most new FADCA members during this period will receive a TAPR TNC2. There will be prizes for second and subsequent placoes too. Credit is awarded based on the contestant's name or callsign on the new member's enrollment form. The new member also gets credit for his own enrollment. So far no one has cinched the TNC2 prize (minimum 15 new members to qualify), but the leader has 10 members to his credit and there is lots of time left....

So, get busy. Make some copies of the membership form in this issue, or send an SASE to FADCA for a new supply (Say how many you need). Show your BEACON issues to your friends, show them the article in the November issue about PACKET RADIO MAGAZINE, get them to do themselves a favor by joining FADCA, and help yourself to that TNC2.

The dues are simple. $12 for 1986 membership (new or renewal) through January 31st, then $15.

FADCA VOICE NETS

REGIONAL (FLORIDA AND ADJOINING STATES): 3958 KHz Sunday 8 AM EST. NCS: K4NTA. We are looking for a NCS in far north Florida or Georgia to conduct a session one hour later at 8 AM CST.

SOUTHNET COORDINATION NET: 7190 KHz each Sunday at 2 PM. NCS: W4FX.

BRANDON (TAMPA BAY AREA): 147.165 (+600) Sunday 7:30 PM EST. NCS: KB4LLO.

BREVARD COUNTY AREA: 146.940 (-600) Sunday 8 PM unless Space Shuttle audio is being broadcast.

BROWARD COUNTY AREA: 145.270 (-600) Sunday 8 PM. NCS: K4GFG

CRESTVIEW (Panhandle): 147.360 (+600) Sunday 8:30 PM (after traffic net). NCS: K3NN

FT MEYERS: 50.150 USB Tuesday 7:30 PM. NCS KB4CIA.

MARION COUNTY AREA: 146.61 (-600) Thursday 0045Z. NCS:K4OZS

GAINESVILLE: 146.91 (-600) Monday 8PM.

STUART:147.060 (-600) Sunday 8 PM.

WEST PALM BEACH CO: 147.285 (+600) Monday 8 PM.

NNC DEVELOPMENT AND TESTING

To: All Interested Packeteers
Fm: Lyle Johnson, TAPR President
Re: NNC Development and Testing

As many of you are already aware, the new TAPR Networking Node Controller (NNC) is nearing completion of prototype hardware debugging. The NNC is a four-port packet controller with a large memory area, direct-memory access (DMA) capability for I/O -- and Z-80 software compatibility.

There presently exists NO SOFTWARE for this device. None! We are looking for volunteers to assist in developing software for this device.

We need low-level, highly-efficient drivers for the I/O. We need an AX.25 Level Two handler that can handle multiple logical and physical channels. We need Level Three and Level Four. We need loaders for uploading software updates to a remotely-sited NNC. We are hoping that there will be early porting of multi-port digipeater code to this unit as well as a WORLI PBBS. We need close coordination of the various aspects of the development. We need... You get the idea.

The hardware should be verified during December. If all goes well (it usually doesn't), we will want to put Alpha units in the hands of developers in late January/early February. Assuming a couple of months to get enough software together to make Beta testing meaningful, we will be looking for Beta testers in the March-April timeframe. Once testing has advanced to the point of reasonable confidence, we will make the units generally available (summer of 1986?).

Now, we are NOT looking for folks who want to be the first kid on the block with a new toy. We need people who are committed to Amateur packet radio and want to help make a meaningful contribution to a very large and difficult task.

And be forewarned. You may slave away for many, many hours, only to have your code not used, or superceded, or... No guarantees.

Coordination is going to be a tough assignment. Without proper coordination, a lot of wheels will spin, and a lot of energy wasted in duplication of efforts. A BBS to swap code modules will be needed. All code will need to be carefully, accurately and exhaustively documented -- by the author!

Developers will need to procure the following:

1) One NNC digital unit - projected cost is $175. This is an NNC with uP, 64k bytes of bbRAM, 32k bytes of EPROM, four HDLC ports, two parallel (centronics compatible) ports, two async ports and one SCSI interface. The SCSI chip may not be included at this price, we are not sure yet, but for the Alpha testers/developers it will be. This unit will be fully assembled and "tested."

2) One NNC Floppy Adapter - projected cost $125. This includes a DMA'ed Floppy Controller that can handle 4 diskette drives. This unit will NOT support 8" drives (lack of 8" support is intentional). The price includes a licensed copy of Z-DOS, a CP/M 2.2 compatible operating system. It will be on a 5.25" double-sided 48 tpi diskette format capable of 368k bytes (formatted). If the decision is made up front to use 96 tpi drives, TAPR will copy the licensed diskette to the denser format and supply the original as well as the high-density copy to the purchaser.

3) A pair of 5.25" floppy drives. Maybe we can do a group purchase of TEAC 55Bs. Figure $150 for this expense. 48tpi or 96tpi are about the same price. 48 tpi yield about 400k formatted bytes; 96 tpi about 800k formatted bytes.

4) A power supply. $50 from surplus sam?

5) One NNC Modem board - projected cost is $150. This is a wired and tested board which includes one 300-baud 2206/2211 modem with tuning indicator and three 1200-baud 2206/2211 modems. We might get this cost down to $125.

Thus, there is a cost of participation that will be a minimum of $450 and may be $650. Add to this the cost of an assembler or compiler...

The assembler that seems to make the most sense is ZAS, from Echelon systems. Again, we can probably do a group purchase or multiple-site license for this project. This assembler supports the extended instruction set of the HD64180 cpu. There is no reason to limit ourselves to the Z80 instruction set (or - yeech - the 8080 subset) for this project. And ZAS is fairly cheap - about $50, I think.

I don't know which C or Pascal compiler will be chosen. I assume that one will be chosen, so the high-level code can be written in a transportable high-level language (makes for easier testing?) while the interfaces to the hardware can be done in assembly language. Preferably, the compiler will generate Z80 (or 64180) source code for assembly by ZAS. This allows hand-optimization of the compiler output.

By standardizing on the development environment (NNC w/5.25" floppies) and the tools (assembler, compiler(s)), we hope to make it easier for all participants to share their work amongst the group.

It is expected that all code (including source code) developed for this project will be placed in the public domain for non-commercial use. And that TAPR will be given explicit (not exclusive) right to distribute it.

If you have the time and ability and want the chance to make a real contribution to Amateur packet radio networking development, please leave a message on DRNET or write the TAPR office. We will put you on file and notify you when we are ready to get started with Alpha test or Beta test (as you indicate to us).

For Alpha test, we need developers. Committed developers. People who really understand software design, hardware/software interaction, protocol implementation, code size/speed tradeoffs, data structures and myriad other facets of software design. And of course, understand networking...

For Beta test we need testers. People who are in a 'real packet environment, who have a good site that will get plenty of exercise on the air, who have the time and commitment to submit detailed reports of what works and what doesn't. This isn't a "be the first person on your block to own an NNC" contest; it is going to require work.

What do we mean by commitment?

Consider a plate of bacon and eggs. The chicken was actively involved; the pig was committed.

If you are a capable packeteer, committed to assist in networking development, please provide us with the following:

Full Name.
Amateur Callsign.
Mailing Address.
Daytime telephone number.
Evening telephone number.
Alpha or Beta test.
TAPR membership number (if applicable).
Specific areas of expertise that you wish to make available to this project (low level interface/high level protocol implementation/documentation/testing/etc.)

Thank you for you help. Happy packeting!

NEWS and VIEWS

Continued from page 1

The plan was adopted after considerable debate. It appears to me to be an acceptable method to foster LAN activity on other than 145.01, but there are considerable restraints on what individuals and sysops may do. The plan works around the congestion problem by reducing access to the 'network' - in effect no inter-LAN communication is allowed during portions of the day, and MailBoxes are limited in the hours that they may forward traffic.

The real answer to congestion is greater network capacity. Like hours in the day, there will probably never be adequate capacity, but the technology is available to greatly improve the bandwidth of our network. I am glad that network congestion in Florida has not brought us to the position faced by our friends north of the border, and am confident that the current efforts at network building will soon pay off in better operating conditions for everyone.

Linking software of several varieties has been written (including the efforts mentioned by N2WX is last month's BEACON). It is time to get our RF gear in place so that we may take advantage of these software advances.

C U next month in the pages of PACKET RADIO MAGAZINE.

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SOUTHNET II

Continued from page 1

the packet magazine featuring articles of packet interest published in spell-checked but virtually unedited form. There is a very short lead time for his publication.

Attendance at these sessions and in the equipment demonstration area shows that packet is entering the user phase of development with great need for information and coordination. The questions asked are very basic and this need will have to be addressed immediately, if packet is to continue in a smooth growth.

ADVANCED SESSIONS

Jack Brindle, WA4FIB, presented his Session Layer Protocol based on a great deal of work on MacPacket Term, his software interface for the Macintosh computer to several TNCs.

Gwyn Reedy, W1BEL, presented Tom Kneisel's paper dealing with the relatively unsucessful efforts to use the K9NG modem with the Hamtronics FM-5 220 Mhz radio. Gwyn laid out FADCA's plan to use the Florida 220 Mhz wideband allocation at 1200 bauds until a good high speed modem/ radio combination is developed.

Lyle Johnson, WA7GXD, showed the main processor and disk controller boards for the TAPR Network Node Controller (NNC), and presented the design philosophy behind the NNC and related components. Details on each board were given with parts specifications and tentative costs. On Sunday, Lyle conducted an open Q&A session about the system. Both sessions were well attended showing the interest in any higher level solution to networking. Lyle took names from about 10 people interested in testing the hardware and in developing networking software for the NNC. Lyle's presentation (including the current manufacuring licensing of the TAPR 2 TNC to four companies) was videotaped and is available for $15.00 from GRAPES. P.O. Box 1354, Conyers, GA 30208.

Byron Lindsay, W4BIW, presented the latest update on PACSAT, scheduled to be launched in 1987. PACSAT will have a low earth orbit of about 500 miles ,an orbital period of 90 minutes, and a window of access of about 10 minutes. Uplink will be on 420 mhz and downlink on 2 meters. PACSAT will carry 4 megabytes of store and forward memory. Plans are in the works to provide a gateway to this satellite in the Atlanta area.

Bob, N4HY, informed us of an exciting shuttle experiment which will probably be carried on the March shuttle flight. The shuttle will carry a TRS-80 model 100 computer and a TNC-2 especially modified for space. The automatic station will be accessible during the entire shuttle mission. The user on the ground will connect to the station and be given a QSO number and then automatically disconnected. The QSO will be logged and a QSL card sent on request. Further details on the mission, and procedures will be given in all available media. For the past few evenings Bob has been demoing and checking the robot mode TNC 2 software at N4HY in Auburn, Alabama. On connecting to his station you are given a QSO number just as it will operate in space. I hope it is as easy for us to connect to the machine in space as it has been on 145.01 (HI).

Jim Worsham, WA4KXY, gave a tutorial presentation on modulation techniques and made some suggestions for real hardware which will support high speed communications. No proposal for development has been made for a high speed transciever deck, but we are certain it will come.

Ed Jackson of GLB reported on GLB's design philosophy and a number of on-going packet related projects. Needs of the packet radio community were discussed in detail and Ed took as many notes as he brought.

Jack Sanders, NC4E, discussed message formats for use in emergency communications and presented a very fine proposal to use X.12 presentation layer protocol to handle written message traffic in amateur packet radio. This standard is used for business forms transactions in current networks. Jack has done a terrific amount of work on the proposal and it really interfaces nicely to the ham radio needs. Jack went home and spent most of Saturday night working on an application level program on the IBM PC and since then I (Eric, N4CI) have been working on a BASIC application program for the TRS-80 model 100 computer. I think we will see more of this proposal as packet begins to be used for serious traffic handling and emergency communications. Copies of Jack's proposal can be obtained from GRAPES for $1.00 and an SASE (software is not available at this time)

STATE SESSIONS

Saturday afternoon was devoted to SOUTHNET state sessions. These were attended by over 50 digipeater and WORLI BBS providers. Current frequency plans, number of users, projects, locations of 145.01 digipeaters and other related topics were presented by WB5RAX - Alabama, WB4GQX - Georgia, W1BEL - Florida, WA5DVV - Mississippi, and W4FX - South Carolina. Then followed a session conducted by Dennis, WB4GQX, to try to get a general consensus on "145.01 network crowding" and solutions to the problem. A proposal made for Georgia by N4CI was distributed at this time and further discussed on Sunday after the SOUTHNET open meeting. The proposal is an extension of Harold Price's suggestion for a PNA (state networking committee.) There was much talk about the written proposal in the halls, coffee shop and in private discussions. Requests for copies were honored all during the weekend. In the Sunday session the proposal was accepted and ratified by the GRAPES and accepted in principle by adjoining SOUTHNET states. (See separate article.)

At the dinner on Saturday evening, SOUTHNET Awards were presented. A plaque was presented to Gwyn Reedy, W1BEL, for his outstanding contributions to packet radio in the region. SOUTHNET Certificates of Appreciation were awarded to Howard Goldstein, N2WX, and Ted Huf, K4NTA, for their continued dedication to networking and producing packet related Z-80 software, and to Tom Kneisel, K4GFG, for his work on the high speed modem project. GRAPES Certificates of Appreciation were awarded for contributions to packet radio in Georgia. Recipients were KD4NC, KF4JF, WB4GQX, N4CI, WD4LYV, WB2CPV and K4ABT.

SOUTHNET was a success by any measure and its attendance from over the whole region very gratifying. It does point to a need for more of these regional meetings as packet radio grows. Two really big needs are obvious. 1) We need a National Committee or organization of regional bodies, and 2) there is a need to coordinate HF use of packet. ARRL is requested to give some recommendations for non-user accessible HF store and forward MailBox/Gateway channels, Simplex calling frequencies, and HF user accessible MailBox channels.

See you in Orlando. de N4CI

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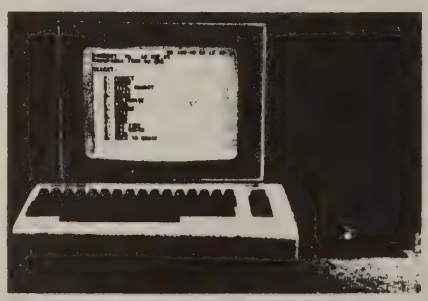

PK-64 shown with HF modem option.
Computer not included.

We can't possibly list all of the important features of Pakratt here. But the absolutely best part of the Pakratt PK-64 is that it's at your dealer now. So stop reading, run down to your local dealer, and check Pakratt out. Because the real challenge will be to find one after the other hams see it.

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Telex: 6972496 AEA INTL UW

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TWO METER DIGIPEATER
NETWORK OPTIONS

Continued from page 1

a single digipeater, to increase local digipeater access to the user, and to increase the link margins.

A disappointing aspect to this approach is that, after we invested in all this hardware, our normal throughput would probably not be significantly increased. This is because we would have the digipeaters located in sufficient proximity to one another that in talking to the next digipeater down the road we would inhibit the digipeater two nodes down the road.

An alternative implementation would be to construct a parallel network on .03, which was interspersed between the .01 nodes. Since there would be fewer collisions/inhibitions we could reasonably expect to somewhat better than double our current data rate. This represents an improved return on investment but there is still a lingering reliabilityproblem in that two failures,one on the .01 network and one on the .03 network, tend to fracture o~ur communications.

At this point it is useful to toss in a conjecture; what would be the effect if the .03 digipeaters were frequency agile?

Then we would have the capability to shift a digipeater from the .03 system to the .01 network. This ability to bandaid the .01 path would make it very resistant to failure, since it would take a localized hit taking out several digipeaters for the .01 path to suffer.

Having gone this far it is a logical extension to suggest the existence of frequency agile digipeaters on .05, .07. and .09. These digipeaters, which may or may not be nominally independent from the statewide network, could be called upon to fill in the .03 or the .01 paths as required. This additional layer of redundant hardware would give us additional confidence in our ability to maintain overall system integrity.

A system of digipeaters, as described, could very well take on the appearance of the following map. A certain amount of poetic licence has been taken, in that all the digipeaters shown are in a straight line. No difficulty should be had in expanding this map to the more general case, where digipeaters are laid out over an area instead of in a collinear fashion. Florida represents a peculiar case in that our population densities reside primarily along the coasts, therefore the straight line map, as drawn, probably closely describes the real situation here.

CURT PARRISH,K4TL
Electronic Kit Assembly & Repairs
306 W. Amherst Avenue
Melborne, Florida 32901
(305) 723-8659

```
 1 #

* 2

3 # ^

* 4

 5 # @

6 * $

7 # ^ 8

9 * @

# 10

# 145.01
* 145.03
^ 145.05
$ 145.07
@ 145.09
```

There are a variety of ways in which the agility could be implemented. The rewards that could be garnered would be,as you would expect, roughly equal to the cost and difficulty of the implementation.

The easiest way is to simply have the control operator manually set in a new frequency. This capability already exists on several digipeaters in that they utilize multichannel radios.The obvious drawback to this method is that the network repair is delayed until someone can get out to the digipeater site. This is still an improvement though, since digipeaters have sometimes been down for a period of weeks due to a lack of parts or expertise. The system has been impaired accordingly for that same period.

A slightly more complex method of implementing agility would be to utilize sequential DTMF signaling. There are an abundance of DTMF encoders and decoders on the market and with a minimal number of digital glue parts the desired control functions could be accomplished. The circuits in question are all familiar from voice repeater autopatches and should prove to be a cookbook recipe. I suspect that there is even a distinct possibility that the parts could fit on to the breadboard corner of a TNC-1 board.

This method would work very easily for a commercial radio which would normally be used in conjunction with a control head. In the case of an older multichannel crystal amateur radio, it would be a fairly straight forward task to either bring control lines from the selector switch to the back panel, or to modify the radio for diode switching.

There is a definite increase in difficulty with many of the synthesized radios. For instance, one manufacturer favors the use of a photo interrupter to drive the microprocessor, which in turn addresses the synthesizer circuitry. This is mentioned merely to illustrate the point that to interface to many of the later model amateur radios is discerningly more difficult than to interface to their crystal control predecessors. Dealing with electro/ mechanical/ optical devices and proprietary software is not an insurmountable task but it is a non-trivial one. This is particularly true of those radios which look like the manufacturer ran them through the trash compactor prior to shipping in order to get the size down.

The next solution would be to add a "smart box" at the user port of the node controller. Several advantages accrue to this approach.

The first advantage is that the network can readily control the digipeater. If I am at digipeater A and have access to digipeater B but need to switch digipeater C, which is the next one down the path from B, then I can do so. If digipeater C used DTMF and digipeater B did not have the prerequisite capability, then this would not be possible.

A second advantage is that the opportunity avails itself to conveniently incorporate a fair degree of security from accidental or malicious tampering with the operation of the digipeater being controlled. This can be readily accomplished by necessitating, in the previous example, that I pass a change request word to digipeater C, who then sends me back a check word. Upon performing a confidential algorithm based on this randomly chosen check word, I pass the results back to C. C confirms my response, and then authenticates me to take whatever class of actions that he has previously authorized.

A third benefit is that, in the case of a synthesized radio, it may be more convenient to control the frequency shifting if part of the logic can be partially accomplished in software instead of in hardware.

The last bonus is that the previous schemes were basically static in operation, i.e. they do not lend themselves very well to relatively fast dynamic switching.

The "smart box" to accomplish this function would not necessarily need to be anything much more than a Radio Shack Color Computer.

The last possibility for frequency switching would be to modify the firmware in the node controller. There may or may not be reasons why this can not be technically accomplished, but I suspect that the personnel capable of doing this task are already committed to other projects. This solution is not being actively proposed but is included for the sake of completeness.

Now that we have established all these new resources the next question is what do we do with them. I would like to tentatively suggest that .01 be utilized for long distance keyboard to keyboard type communications. BBS operations are an important aspect of packet radio and therefore turning over .03 to them for realizing that goal might be a prudent action. Finally, we could use .05, .07, and .09 for local communications.

Continued on next page.

TAPR TNC-2 IS NOW

PAC-COMM TNC-200

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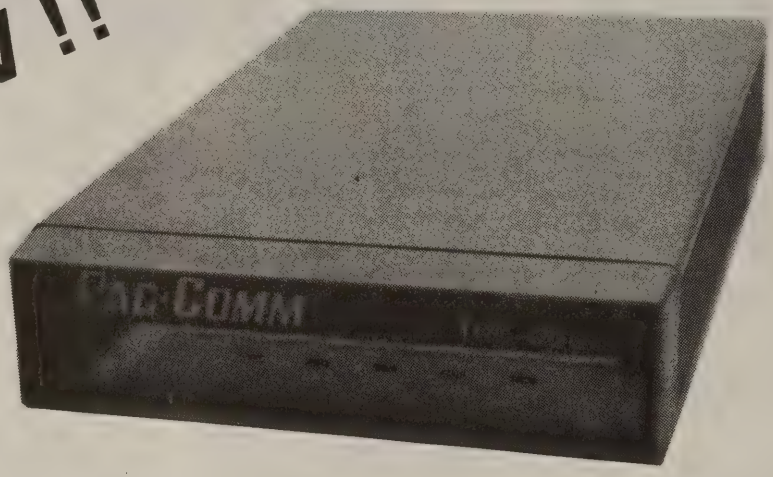

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Continued from page 7.

The reservation of .01 for long haul keyboard operations would enable Miami users to take advantage of band openings in order to penetrate up into Georgia, Alabama, or the Carolinas. It would, for example, enable W1BEL in Tampa to communicate with K4GFG in Ft. Lauderdale, effectively, on a real time basis, over packet. This quality of communications is something which many operators have expressed disappointment over, in that it does not currently exist.

In order to receive BBS traffic from adjacent territories which do not have a .03 network, we would need BBS nodes at the boundaries on .01 which could serve as transfer nodes.

The FADCA BBS operators are getting slicker every day and besides their mailbox functions, seem to be getting increasingly adroit at sliding large files around the state. For this reason, I see no reason why I should put a large file on .01 and effectively crash the path when I can lazily hand it off to the BBS boys and let them worry about it. It will normally get there in a manner of hours and how often do you really need faster service than thae in their performance, since it would consist of communications between relatively few operators who could take advantage of this fact in coordinating their activities.

Most of us recognize that after an initial burst of DX'ing when we first get on packet, we tend to settle down into a lot of local chats with fellows we've eyeballed with. This type of need is being addressed in Miami by the HLO repeater on .09. I could see where this idea could be extended, by say two or three digipeaters in the Palm Beach-Dade-Broward county on .07 to support tri-county communications exclusively. Local digipeaters and regional digipeater strings would seem like an excellent way to reduce .01 loading.

One drawback to this proposal is that the lament is surely going to be voiced that there is a loss of connectivity.

If WA1TZH desires to talk to K4NTA, who happens to be temporarily residing on .05, then she would be unable to contact him, since she cannot directly access the .05 local digipeater. An interesting possibility would be that if the .01 digipeater,which was nearest the .05 digipeater in question, had the ability to dynamically frequency shift, then contact might still be possible.

Having failed to locate K4NTA on .01, WA1TZH decides to check the Stuart .05 digipeater. She does this by generating a packet which would be interpreted by the Stuart digipeater as a request for it to generate a CQ on .05 for K4NTA from WA1TZH. The .01 digipeater waits for a lull in activity on .01, shifts to .05, and senses whether .05 is active.

If .05 is quiet ".01" blurps out a beacon with the appropriate text and shifts back to .01.

If .05 is busy then .01 shifts back to .01, conducts business as usual for a period of say 5 seconds, and then retries the .05 frequency.

There are several variations and elaborations on the above mentioned scheme that are possible.

The original CQ request from WA1TZH to the .01 digipeater could have involved an interactive dialogue. The purpose of a dialogue would be twofold; to verify that the CQ request was not accidentally imbedded in a normal packet and also to query for parameters such as how many times should the .01 digipeater should beacon on .05.

Another possibility would be for the .01 digipeater to generate a connect request on .05. Some users would desire to see a time stamp on the .01 transmissions indicating when the original request was submitted. Still another variation would be to be able to specify a time duration between .01 retries.

The basic point is that if you have intelligence at the .01 nodes and the ability to rapidly QSY then many of the operational features become incremental pieces of gingerbread.

The observation that the .01 digipeater is not "minding the store" while it is off on .05 deserves comment. The period to QSY, check for activity, make a logical decision, and return to .01 should constitute less than 200 milliseconds. This is essentially what every scanner or radio with priority does, and they seem to take appreciatively less than this time period.

The time in which to blurp out a packet should not require a period exceeding that for any other packet of similar length. There has not been a huge hue and cry over the practice of digipeaters id'ing via a beacon format, and the frequency shifting of a digipeater will not impact the overall system to any greater or lesser degree.

The full utilization of our currently authorized two meter spectrum would give us an immediate increase in our system capacity, roughly fourfold, independent of high speed linking. The hardware involved is basically the same two meter radios and node controllers that we are currently using for digipeaters. Therefore the cost of implementing a system along the lines suggested is fairly well defined and in many cases could very well be simply a matter of two or three individuals taking upper shelf dust collectors and pressing them back into active service. A cost effective improvement generally warrants active consideration.

Does a two meter expansion supplant the need for high speed linking? It does not. An immediate increase in capacity would relieve much of the interim congestion until HSL is fully implemented and debugged, but it does not eliminate the real need for HSL.

Will HSL make the additional two meter digipeaters obsolete? It will not, for two independently adequate and sufficient reasons.

In the event of an HSL node failure, it may be necessary to divert traffic back on to two meters. With the outlined system we would brown out instead of blacking out, the existence of a number of fallback positions would make it much more difficult to totally lose service.

The other reason that the two meter digipeaters will remain a sound investment is that they could shift from being primarily forwarding nodes to simply being LANs with HSL linking. No matter how you slice it, or no matter how fast HSL functions, a single 1200 bps two meter access port has got to be inadequate for the long term requirements of an area the size of metropolitan Miami.

The primary interest these days for software people appears to be networking and linking. There have been several derogatory references to "old digipeaters" in the press lately, but it is unclear that we've fully developed them yet. 1985 has seen the price fall out from under RAM, floppy disks, and hard disks. Can we now afford to push digipeaters a half notch up the ISO model? If, upon establishing my original contact through a string of digipeaters, the local digipeater would then accept responsibility for subsequent packets, then a lot of retries could be avoided.

The argument could be advanced thatthere is no reason to improve the two meter system because HSL will render two meters into being simply a bunch of LANs. The rejoinder to this is that an efficient two meter system is the best fallback position for HSL node failures. It is also unclear that HSL can ever be affordable for nodes with small amateur populations, or that have to cross large distances (multi hop VHF) in order to reach to a major nodal point.

This article has outlined a few ideas, and it would appear that there are plenty of voids out there for fellows that like puttering with a soldering iron or banging away on a keyboard. So if you've just replaced your TNC-1 with a spanking new TNC-2, and your buddy Joe has an old IC230 sitting in his garage, then ... .

C685 CC1299 Jack Powers (JackP,218)
11/23/85 3:40 PM L:14
KEYS:/FREE REFERENCE BOOK / FROM SIGNETICS / DATA COMMUNICATIONS/

Followers of this conference may be interested in an excellent publication that covers a large part of the technical end of data communications and it's (get this!) FREE. It's the Signetics Data Communications Handbook, from Signetics Corp., 120 E. Main St., Wappingers Falls, NY 12590, (914)- 297-4074. The number of the publication is 98-8004-000. I suggest calling them or writing on a business letterhead.

It's 73 large pages long, describes many of the data services available today, and includes a glossary and lots of good references.

XEROX 820 CENTRONICS PRINTER PORT

Ted Huf, K4NTA

Being a system operator of a WORLI MailBox has caused me to really miss having a printer on my Xerox 820 since the normal serial printer port is connected to a TNC on 20 meters. Looking through the CBIOS that Hank supplies on the distribution disk, I found reference to using the parallel port on the 820 for a printer and it looked like it might work just by connected the printer to the J-8 on the 820.

It turned out that I could not get it to work with the code in Hank's CBIOS.MAC for some reason. In any case I made a couple of changes and it now works fine as the LST: device. I am using a Epson MX-80.

```
  820                                PRINTER
PA0 J8-6 ------------------> DATA 1
PA1 J8-8 ------------------> DATA 2
PA2 J8-10 -----------------> DATA 3
PA3 J8-12 -----------------> DATA 4
PA4 J8-14 -----------------> DATA 5
PA5 J8-16 -----------------> DATA 6
PA6 J8-18 -----------------> DATA 7
PA7 J8-20 -----------------> DATA 8
PB1 J8-28 <----------------- BUSY
PB4 J8-34 -----------------> STROBE
```

ALL ODD NUMBER PINS ARE GROUND BUT MAKE SURE THAT THEY ARE REALLY GROUNDED ON YOUR 820 BOARD!!!

PLACE JUMPERS ON J-11 AS FOLLOWS:
9-10 PA4-PA7 OUTPUT
11-12 PB4-PB7 OUTPUT
17-18 PA0-PA3 OUTPUT

Make sure that you have this set up as shown near the start of the CBIOS.MAC

```
; What to do with the PRINTER port.
; Set ONE of these tags to true.

pistnc  equ     true
piscon  equ     false
pispr   equ     false

; What to do with the parallel port.

parlst  equ     true
```

Below is the parallel printer driver with the changes that I made.

```
        if      parlst
pu4ot:  in      a,(pio.bd)
        and     2
        jr      nz,pu4ot
        ld      a,c
        out     (pio.ad),a
        push    af
        di
        in      a,(pio.bd)
        res     4,a
        out     (pio.bd),a
        set     4,a
        out     (pio.bd),a
        ei
        pop     af
        ret

pu4ost: in      a,(pio.bd)
      , and     2
        jr      nz,notzer
        ld      a,0ffh
        or      a
        ret
notzer: xor     a
        ret
        endif
```

[ed note: Micro-Cornucopia magazine has a printer article in issue 18 (June 84) on page 41 which may also prove helpful.]

*****NEW *** PAK–COMM *** NEW*****

The PAK–COMM program is written for packet radio terminal controllers. The program enables the operator to enjoy the uses that packet radio offers by taking care of the housekeeping, and provides the little 'extras' that make daily operations easy. Use PAK–COMM for both modem and packet work.

Com Parameters: 300–9600 bps, set port, parity, data bits. A start–up file with pre–defined communication parameters, file transfer protocols, date/time stamp options, operator identification line and space for command macros. Set up many files, pick at run time.

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Split Screens: Separate transmit and receive screens with full line buffering for the transmit. This will enable you to monitor all channel activity while composing messages. Set split where you wish.

File Transfers: You may use transparent or x–modem protocol. Constant character count is provided to monitor activity.

Command Macros: The Alt function keys are available to send strings of up to 250 characters or timing loops that are sent to the controller in one keystroke. Setup complex rpt chains or BBS logons.

Help Screens: Two individual help screens are available. one is a text file to be modified by the user. A good place for system maps.

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The FADCA SOFTWARE LIBRARY

The FADCA software library is operated by Howard Fisher, N4KPU. The library specializes in public domain software oriented to the amateur using digital communication methods. When in full operation the library will provide a full suite of Xerox 820 software, CPM and MSDOS development tools and terminal programs etc. There will be limited support for Commodore 64 and other popular computers, also.

Howie has the ability to do both 8 inch CPM and 5 inch MSDOS formats, as well as most Heath H-89 supported 5 and 8 inch formats. He will have access to equipment producing Kaypro and C-64 disks, and possibly other brands. If we can work out all the arrangements, he will be able to provide EPROMmed software also. Charges will be nominal and intended only to cover operating expenses. Any excess funds will accrue to FADCA.

Please send your software contribution to Howie at the address below. Provide whatever documentation you can on the diskette and include your name and address as well.

Howard Fisher, N4KPU
3191 Willow Rd.
Wimauma, FL 33590

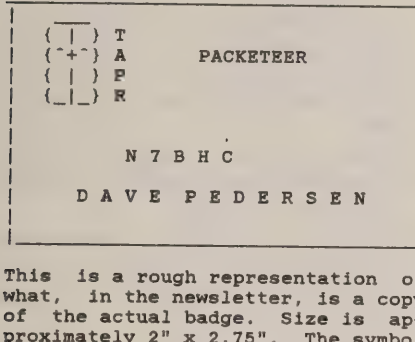
Florida Packet Frequencies
LAN and calling freq: 145.010
Local QSOs & file xfers:
NOTE: Local usage varies.
145.030 /050 /070 /090
220 LANs (20 KHz bandwidth):
221.720, 221.780

Here are some excerpts from the UPRA CONNECT published by Dave Pedersen, N7BHC.

NAME BADGES

Right alonside the Packet Radio booth at the WIMU hamfest was Roylance Communications, who make custom nametags. When asked why they didn't have anything with a TAPR "Cactus-on-a-chip" logo, they offered to make a sample, which they have indeed
done.

As you can see, it has the TAPR logo in the top left-hand corner. It comes in many colors, and your choice of wording. Cost is $4.00 ppd in Salt Lake City in lots of 10, and $4.20 ppd elsewhere in lots of 10. Order from UPRA, 4382 Cherryview Drive, West Valley City, UT, 84120.



This is a rough representation of what, in the newsletter, is a copy of the actual badge. Size is approximately 2" x 2.75". The symbol at the top is a cactus on a chip.

TNC-1 AND C-64 INTERFACING

I have found the following program to work very well with the TAPR TNC-1 and the Commadore C-64 computer. Unlike several published programs, this one prints both upper and lower case characters. When using it, turn the echo function off. It allows for the use of the function keys to make operation somewhat easier. They are set-up as follows:

F1 = Control C
F2 = Control Q
F3 = Converse + return
F4 = Control S
F5 = Monitor on + return
F7 = Monitor off + return

I have found these command to be most useful to me in operating the TNC, but feel free to customize these commands for your convience. The program doesn't allow for error detection, but I have found this to be of little consequence. If you find ways to improve this program, I would very much like to hear from you.

```
  1 Goto 100
  2 *
  3 C-64  Packet Terminal
  4          by
  5  Gary W. Clark, NB7B
  6 *
100 Open 2,2,2,chr$(6)
    :Print chr$(14)
110 Get A$
120 If A$=chr$(133) then
      A$="Control C"
130 If A$=chr$(134) then
      A$="Converse" + chr$(13)
140 If A$=chr$(135) then
      A$="Monitor on" + chr$(13)
150 If A$=chr$(136) then
      A$="Monitor off" + chr$(13)
160 If A$=chr$(137) then
      A$="Control Q"
170 If A$=chr$(138) then
      A$="Control S"
180 If A$<>""then print#2,A$;
190 Print A$;
200 Get#2,B$;
210 B=asc(B$ + chr$(0))
220 If B>64 and B<91 then B=B+128
230 If B>96 and B<123 then B=B-32
240 C$=chr$(B)
250 Print C$;
260 Goto 110
```

NOTE: In line 100, chr$(6) controls the data rate between the computer and the TNC (ABAUD). The following values will yield the associated data rates:

chr$(x)	=	baud
4	.....	110
5	.....	150
6	.....	300
7	.....	600
8	.....	1200

Interfacing the TAPR TNC-1 (and its several clones. the AEA PKT-1, the Heath HD-4040, and the HAL TNC) turns out to be a slight problem. The I/O port on the C-64 uses TTL levels, whereas the TNC is RS-232. There are two ways around this problem; one is to buy or build an RS-232 interface for the C-64 (up to $40). The other is to make the TNC talk TTL level signals. This is very simple, and is the method I use. Bear in mind that the TNC operates on TTL levels internally, and merely converts to RS-232 in order to be more compatabile with the rest of the world. [ed note: see previous FADCA>BEACON articles on cautions about interfacing at TTL levels without buffering.]

Replace the RS-232 driver/receiver ICs, U-15 and U-16 in the TNC with the headers (with jumpers), as shown below. This allows for direct connection between the C-64 and the RS-232 port on the TNC. The interface cable required is also illustrated below.

Paraphrased illustration ...
Replace U-15 with a header, connecting pins 2 and 3 together...
Replace U-16 with a header, connecting pins 1 and 3 together, as well as connecting pins 6,7,8,and 11 together.

The interface cable as follows...

C-64 user port to RS-232 on TNC

B and C	.....	3
M	.....	2
N	.....	1 and 7

If anyone has found a way to keep the receiver buffer in the C-64 from filling up when using baud rates above 150 from the TNC to the computer, or if you have had problems with the computer not generating a Control-Z, I would like to hear from you.

Gary W. Clark NB7B
1510 Brookbury Way #101
Salt Lake City, Ut 84123
(801) 266-4251

FROM COMPUSERVE HAMNET
#: 34853 S9/Packet/RTTY/AMTOR
21-Nov-85 01:48:50
Sb: WORLI clone for IBM
Fm: Jeff Jacobsen, WA7MBL
72446,2557
To: All

I have almost finished a translation of the WORLI BBS software into Turbo Pascal for use on IBM PC/XT/AT. The Mail portion, including forwarding, and the Gateway portion all seem to work fine. I havent added "J" lists or monitoring yet, and still have to add a few local commands. I will upload the program as soon as it is finished. However, there is very little activity here (at present I can contact 2 others on Packet) which makes testing a little difficult. Also, I am working from a source listing, but have never seen a "real" WORLI BBS in operation and have no access to an 820 to try it, so I can't be sure if it looks exactly correct. If someone is interested in testing it as is, I would be glad to mail a copy on diskette before I spend a small fortune uploading it here. I am working with the version 10.2 source and should be compatible with the latest forwarding methods. If you really want to test it, send me your address via Easyplex (so it doesn't scroll away while I'm at COMDEX) and I'll mail you a diskette. If you just want to try it, mail me a diskette and I'll copy it off for you. I'm testing it as best I can here with a TNC-1 on one port and a TNC-2 (v1) on the other with no apparent problems.

Jeff Jacobsen, WA7MBL
1400 E 900 N, Logan, UT 84321
MCI Mail: 230-9237
Easylink: 62845849
BITNET: BOBW@USU
CS: 72446,2557

FROM COMPUSERVE HAMNET
#: 35103 S9/Packet/RTTY/AMTOR
30-Nov-85 17:40:54
Sb: New WORLI BBS in London
Fm: David Toth VE3GYQ 72255,152
To: all

There is a new BBS (WORLI v10.0) located in London,Ontario.....call is VE3GYQ and I am handling message forwarding between the eastern U.S. thru to the VE3FXI BBS in Ottawa, and down thru 5 digis and into London. I can forward messages westward to Detroit (N8BMA BBS) and Ann Arbor, Mich.(AD8Y and WA1LRL) and I assume that they can go further west. The plan is to get the second port going on our 145.09 LAN, and leave the other port on 145.01 for linking until we get some hi-speed stuff going on 220. I may try porting to HF if WORLI keeps his arm twisting up. So if we can be of assistance in passing your traffic, then send it our way...hope for a path to Pittsburgh and K3MC this winter with the addition of a digi at Pt. Stanley to get us over to Cleveland and WB8CQR digi.

FROM DRNET ON EIES
C2974 CC104 Skip Hansen
(WB6YMH,2964) 11/30/85 6:54 AM
KEYS:/MORE 9600/

Well the problem I reported in an earlier message with the DCD output turned out to be the deemphasis circuitry in the receiver rolling off the high frequencies too much. After I removed the deemphasis cap the DCD stopped falsing. And we connected successfully! The error rate seems good, at least 80 % of the packets are getting there on the first try. We are still using the relay switching on the Midland's and hope to be getting some PIN diodes to play with soon. I am using a coat hanger ground plane inside of the shack with 10 watts talking to Brea (about a 40 mile path).

Midland 13-509 mods so far:

1. Cut C42 demphasis capacitor out of the circuit.
2. Take the Discriminator feed for modem from the junction of R26, C41 and C39.
3. Cut R110 to remove the phase modulator input from the transmitter.
4. Remove one of the fixed capacitors which is in parallel with the transmitter trimmer capacitors and replace with a MV2111 varicap.
5. Connect a 10k resistor from the modem output to the hot side of the varicap.
6. Bypass the junction of the 10k and the modem output to ground with a .001 cap as close as possible to the resistor.
7. For a keyed to ground PTT signal remove Q2 from the modem and jumper the collector of Q3 to PTT. (This is just a temporary stop gap to test the setup while we get the PIN diode switching built).
8. The PTT and DCD Led drivers on the TNC-1 are from before the modem disconnect connector so they are inoperative when the 9600 baud modem is plugged in. (This was easily fixed with an Exacto knife.)

Well WB6YMH-1 and WB6KAJ-1 are on the air at 9600, ...where's the crowd ?

73's Skip WB6YMH

M 15701 Paul Newland (ad7i,2978)
11/19/85 12:20 PM L:20

TO: all TNC2 Rev 1 and Rev 2 owners
SUBJ: TNC2 latch-up
DIST: open -- please distribute far and wide
DATE: 851119

We have found a problem that appears on a very small number of TNC2 boards. Sometimes, the MF10 switched capacitor filter will latch-up to the positive +5 supply causing the regulator to get very hot. A solution to the problem is to change C10 on the -5V supply from 10uF to 47uF. This cures the problem on all the boards we have seen. If you experience any latch-up after making C10 47uF, please let us know immediately.

Given our results, I strongly recommend that all TNC2 owners, whether they have the latch-up problem or not, change C10 from 10uF to 47uF, regardless of REV number. Thanks!

M 15239 Tom Clark (W3IWI,2976)
11/18/85 1:01 AM L:22
KEYS:/W3IWI PTT MOD FOR TNC2/ CORRECTION/ EATING CROW/
TO: (Group 95)

My modification to the Rev.1 TNC2's has now appeared in several places, including PSR and CTM. This note is to offer a caution, caveat emptor, and to eat a little crow!

In the last paragraph I indicate that you can reverse the sense of the LED from bright=rcv, dim=xmit by attaching the 1k resistor to pin 9 of U14 instead of pin 8. >>>>>> DON'T DO IT!!!!! <<<<<<<

The problem stems from the fact that U14 is used as a part of the BBRAM logic and is powered from the battery when the power is off. If you reverse the sense, then you will be driving battery current thru the LED and will kill your battery in short order.

The mod as I wrote it up (dim on xmit) works fine and doesn't hurt the battery since when the power is off the U14 pin 9 output is low and no current flows thru the LED.

Hence, please delete the last sentence of the last paragraph of my modification notes and forget I ever said it!

M 18103 Lyle Johnson (WA7GXD,2973)
11/28/85 11:35 PM L:87
To: All Amateur Packeteers
Fm: TAPR
Re: Availability of TNC 2
(or, The Rumors are True!)

For Immediate Release

Tucson Amateur Packet Radio is pleased to announce the cessation of its production of the popular TNC 2 kit!

Yes, pleased. An all volunteer R&D, manufacturing, marketing, and support organization is fun for awhile, but it soon takes a great toll on all involved.

TAPR began life in 1981 with a simple goal: To experiment with packet radio and packet radio networks. At that time there was little in the way of easily acquired packet equipment. TAPR took a short side trip into the manufacturing world - to permit widespread experimentation with packet radio by making high quality software and hardware building blocks available on a large scale at low cost.

That job is now complete. The TNC 2 design is stable, and presents a good balance between small size, low power, and ease of manufacture, while still allowing for high speed, full duplex operation, adaptability to future requirements such as split baud rate operation, and easy interface to future modem designs.

It is now time to turn the manufacturing and marketing tasks over to industry, and to continue with Research and Development in new areas of packet radio. We have made our TNC 2 design available to others through an OEM agreement. These alternate sources are listed below:

Continued >>>

Advanced Electronic Applications, Inc. PO Box C-2160
Lynnwood, WA 98036
(206) 775-7373

Model PK-80, available from dealers assembled and tested only. (AEA also produces the PKT-1, a TAPR TNC-1 clone, and the PK-64 which is designed especially for the Commodore 64 computer.)

GLB Electronics, Inc.
151 Commerce Parkway
Buffalo, NY 14224
(716) 675-6740

Model TNC-2A. Factory direct, kit form only. (GLB also produces the PK-1 and PK-1L "software approach" assembled and tested TNCs.)

MFJ Enterprises, Inc.
PO Box 494
Mississippi State, MS 39762
(601) 323-5869

Model MFJ-1270. Available from dealers assembled and tested only.

Pac-Comm Packet Radio Systems, Inc.
4040 W. Kennedy Blvd., Suite 620
Tampa, FL 33609
(800) 835-2246 Ext.115 (orders)
(813) 689-3523 (technical/service info)

Model TNC-200. Factory direct: assembled and tested/ complete kits/ partial kits.

Therefore, assured of the continued availability of high quality TNCs at reasonable prices, TAPR has ceased production with TNC 2 order #1200 (s/n 3721).

TAPR will continue to support software development for the TNC 2 as well as the earlier TNC 1. Other ongoing projects include the TAPR NNC (a networking controller), higher-speed modems, packet satellite support, and other areas of packet development. If enough demand exists, TAPR may make bare boards (no parts) available to experimenters. TAPR has no new TNC hardware products in development at this time.

We invite you to become a member of TAPR, and to attend the next annual membership meeting in Tucson on February 8th, 1986.

TAPR wishes to extend its heartfelt thanks to you, the Amateur community, for your strong and continuing support.

M 5105 Thomas A. Moulton (W2VY,995) 10/19/85 12:22 AM L:4
KEYS:/MODEMS FOR SALE/
TO: (Group 95)

I have a pile of GDC 202's for sale for $25 each, the are working and are strapped for packet work.

I also have a GDC 201, let me know if you are interested, make an offer.

FADCA has 8530-A SCC chips which are used on the FADboard with the Xerox 820 to give a dual HDLC output. These are high speed 6 MHz parts. Only $20.00 postpaid.

QEX September

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American Radio Relay League
Newington, Connecticut, U.S.A. 06111

Gateway

Vol. 2, No. 1
Aug. 20, 1985

The ARRL Packet-Radio Newsletter

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Jeffrey W. Ward, K8KA
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The American Radio Relay League
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FADCA > BEACON

The FADCA>BEACON is published monthly by the Florida Amateur Digital Communications Association, Inc. (FADCA), 812 Childers Loop, Brandon, FL 33511.

Publisher and Editor - Gwyn Reedy, W1BEL
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Mailing labels - Jim Homan, W4DPH
Postal Expense Support - Phil LaMarche, W9DVM
...And lots of help from many authors. Thanks!!

FADCA is a non-profit Florida corporation devoted to research, development, education, and public service. FADCA is governed by a board of directors and administered by officials appointed by the directors. The directors are:

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January 1985	- 620	July 1985	- 600
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Any material appearing in the FADCA>BEACON may be reprinted in any non-profit amateur publication without further permission if credit is given to the author and the BEACON (including the FADCA address.) Commercial publications should contact the FADCA office to make reprinting arrangements.

Reprints of issues of Volume One (1984) of the FADCA>BEACON are available for copying and mailing costs of $1.00 per issue, or $8.00 for the entire year (11 issues). Volume Two (1985) is available for $1.00 per issue for January through June, and $.75 for July through December, or $8.00 for the entire 12 issues. Send your request to the FADCA address.

Please note that the FADCA>BEACON will become a portion of a combined publication, PACKET RADIO MAGAZINE beginning in January 1986. The DEADLINE for submissions for the JANUARY issue of PACKET RADIO MAGAZINE is DECEMBER 30th. Articles should be in final form using a 50 character column width. Authors should request a style sheet from the editor.

DIGITAL EVENTS

JAN 11/12	Sarasota Hamfest.
FEB 8/9	Tropical Hamboree (Miami Hamfest) at Dade County Youth Fair Grounds in Tamiami Park.
FEB 22	Martin County FREEFEST in Stuart.
MAR 1	Hernando County Hamfest in Brooksville.
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Please pass the word to anyone interested in a 220 Mhz Yaesu FT-127 radio ($100) for linking or BBS operation to contact N&G Distributing (305)763-8170. These radios check out OK for 1200 baud packet, and likely can be modified for 9600 baud later. If anyone wants more info, contact me.
Tom Kneisel, K4GFG.

The FADCA modem kit provides a good quality, inexpensive way to get on HF packet, or to provide a modem for your FAD board or state machine on the Xerox 820. The price is $8.95 postpaid from the designer and producer:

Jerry Quimby (N4AJH)
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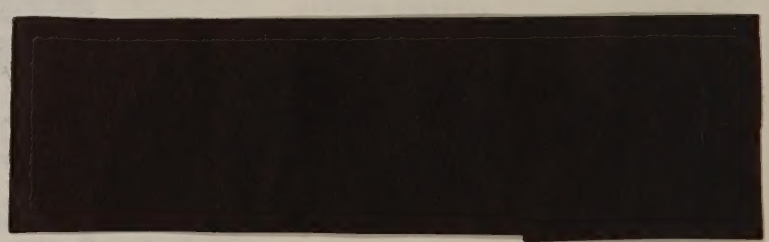
Satellite Beach, FL 32937

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